TRANSACTIONS

OF THE

American Dental Association.

1868.

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TRANSACTIONS

OF THE

American Dental Association.

EIGHTH ANNUAL MEETING,

HELD AT NIAGARA FALLS,

JULY 28 TO JULY 31, INCLUSIVE, 1868.

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DISCLAIMER.

The American Dental Association, although formally accepting and publishing the reports of the various standing committees, and essays read before the Association, holds itself wholly irresponsible for the opinions, theories or criticisms therein contained, except when so decided by special resolution.—*Constitution.*

TABLE OF CONTENTS.

EIGHTH ANNUAL MEETING.

FIRST DAY—MORNING SESSION.

Opening of Session 1
Permanent Members present..... 1
Report of Committee of Arrangements, and Action thereon 2
Committee upon Credentials of Delegates from American Dental Convention 4
Dr. Whitney's Resolution of Invitation..... 4
Committee on Nominations..... 5

FIRST DAY—AFTERNOON SESSION.

Report of Committee on Credentials of Delegates from American Dental Convention, and Action thereon..... 5
Report of Nominating Committee 6
Election of Officers 7

SECOND DAY—MORNING SESSION.

Installation of President Elect..... 7
Address of Retiring President 7
Report of Treasurer and Action thereon..... 17
Auditing Committee 17
Committee on Arrearage of Members..... 17
Vote of Thanks to Retiring Officers..... 17
Dr. Whitney's Resolution to admit to Membership Dentists from Canada, and Action thereon 18
Committee on Invitations 18
Special Committee on Credentials 18

SECOND DAY—AFTERNOON SESSION.

Report of Committee of Invitations 18
Resolution concerning Dr. C. P. Fitch, and Action thereon 18
Report of Auditing Committee, and Action thereon..... 19
Committee to Determine upon Compensating the Treasurer..... 19
Place of next Annual Meeting..... 19
Report of Special Committee on Credentials, and Action thereon.. 19
Resolution to appoint Committee on Revision of Constitution and By-Laws 20

THIRD DAY—MORNING SESSION.

Committee on Revision of Constitution and By-Laws..... 21
Motion to Suspend Twenty Minutes..... 21
Dr. Kingsley's Remarks 21
Report of Committee on Pathology and Surgery—Dr. Atkinson... 28
Additional Report—Dr. Bogue..... 37
Remarks by Dr. Dodge 41
" Dr. Atkinson 43
" Dr. Butler 44
" Dr. Bogue..... 45
" Dr. Morgan 46
" Dr. Judd 46
" Dr. Bogue 47
" Dr. Allport 47
" Dr. Wetherbee 48
" Dr. McQuillen..... 49
" Dr. Robbins..... 50
" Dr. Jno. Allen..... 51
Report of Committee on Arrearages, and Action thereon..... 54

THIRD DAY—AFTERNOON SESSION.

Report of Committee upon Compensating Treasurer, and Action thereon 55
Compensation of Recording Secretary 55
Discussion on Pathology and Surgery—
Remarks by Dr. Taft..... 56
" Dr. Atkinson..... 58
" Dr. Spelman 61
" Dr. McQuillen 62

Remarks by Dr. Wetherbee..... 63
" Dr. Dodge 64
" Dr. McQuillen 66
" Dr. Atkinson 67
" Dr. Allport..... 68
" Dr. Cole 71
" Dr. Wetherbee..... 71
" Dr. Freeman 72
" Dr. Atkinson 72
" Dr. Bogue 72
" Dr. Kennicott 73
" Dr. Weeks 73
" Dr. Wetherbee 74
" Dr. Weeks 74
" Dr. Wetherbee..... 75
" Dr. Horne 75
" Dr. Searle..... 76
" Dr. Hitchcock 76

THIRD DAY—EVENING SESSION.

Paper on Saliva—Dr. Chase..... 78
Remarks by Dr. Atkinson..... 89
" Dr. Wetherbee 89
" Dr. Judd 90

FOURTH DAY—MORNING SESSION.

Dr. Templeton's Resolution..... 92
Report of Chairman, nominating Committee on Standing Committees, and Action thereon 92
Report of Committee on Dental Education—Dr. Judd..... 94
Paper on Dental Education—Dr. Cobb 99
Paper on Hidden Dental Caries—Dr. Knapp 108
Report of Committee on Dental Literature—Dr. Dean..... 113
Remarks by Dr. Atkinson..... 122
Report of Committee on Histology and Microscopy—Dr. Cutler... 123
Remarks by Dr. McQuillen..... 131
Report of Committee on Publication for 1865 and 1866, and Action thereon 132
Special Auditing Committee 133

Exhibition of Interglobular Spaces, and Remarks by Dr. Allen... 133
Dr. Latimer's Resolution..... 134
Remarks by Dr. Atkinson..... 134
Dr. Kennicott's Resolution..... 136
Remarks by Dr. Judd 136

FOURTH DAY—AFTERNOON SESSION.

Amendments to Constitution—Dr. Spelman..... 138
Resolution by Dr. Wetherbee..... 139
Communication of Dr. J. A. Perkins, and Action thereon..... 139
Dr. Spelman's Motion to limit Debates to one hour on each Paper 139
Dr. French's Resolution to read all remaining Papers in succession 139
Additional Report of Committee of Arrangements, and Action thereon 139
Report of Committee on Revision of Constitution and By-Laws, and Action thereon 140
Adoption of Dr. Dickerson's Resolution to change time of Meeting 145
Resolution of Dr. Kennicott, Instructing the Publication of a Synopsis of Parliamentary Rules..... 146
Report of Special Auditing Committee, and Action thereon 146
Report of Committee on Mechanical Dentistry—Dr. Spelman..... 146
Report of Committee on Prize Essays—Dr. French..... 154
Paper on Taking Impressions—Dr. Palmer..... 160
Report of Committee on Dental Therapeutics—Dr. Butler..... 164
Report of Committee on Dental Instruments and Appliances—Dr. Shepard 168
Remarks by Dr. Bogue..... 172
" Dr. Dunn 172
" Dr. Maxwell 172
" Dr. McClellan..... 174
Report of Publication Committee for 1867, and Action thereon .. 175
Remarks by President Taft, and Adjournment..... 176

TRANSACTIONS

OF THE

AMERICAN DENTAL ASSOCIATION.

The Eighth Regular Annual Meeting of the American Dental Association was held in Grant's Hall, Niagara Falls, July 28, 1868.

The Association was called to order at 10.30 A. M. by the President, A. Lawrence, and the session opened with prayer by the Rev. —— Barnes.

Dr. B. F. Whitney, of Buffalo, welcomed the Association to this place of meeting, expressing his gratification at seeing so large a number present at the opening of the session.

The roll of permanent members was now called, the following gentlemen answering to their names:

J. H. McQuillen,	J. Taft,	Wm. H. Atkinson,
W. W. Allport,	W. H. Allen,	H. A. Smith,
Corydon Palmer	B. T. Spellman,	J. B. Williams,
Charles E. Francis,	C. R. Butler,	Wm. Gorgas,
T. L. Buckingham,	Stewart B. Palmer,	J. A. McClelland,
B. T. Whitney,	I. J. Wetherbee,	J. Cheesbrough,
L. D. Shepard,	Geo. E. Hayes,	Sam'l B. Noble,
M. DeCamp,	Wm. N. Morrison,	A. B. Robbins,
Theo. G. Lewis,	F. N. Seabury,	T. P. Abell,
W. P. Horton,	J. McManus,	E. A. Bogue,
J. G. Barbour,	J. Naramore,	H. F. Bishop,
L. D. Walter,	L. Matson,	Geo. B. Snow,
E G. Cummings,	J. A. Perkins,	I. A. Salmon,
Ambrose Lawrence,	M. S. Dean,	Wm. C. Horne,
Alf. P. Southwick,	Chester H. Harroun,	Geo. W. Keely,

J. A. Kennicott,	W. H. Morgan,	A. A. Blount,
Geo. H. Cushing,	N. W. Williams,	B. Bannister,
John S. Marsh,	Norman W. Kingsley,	C. M. Kelsey,
W. F. Morrill,	J. C. Robbins,	C. E. Latimer,
I. W. Lyon,	Thos. B. Hitchcock,	John H. Githens,
J. Smith Dodge, Jr.,	O. C. White,	John Allen,
S. G. Henry,	H. J. McKellops,	Wm. H. Goddard,
J. A. Bishop,	Flavius Searle,	A. T. Paddock,
J. G. Templeton,	G. V. Black,	G. B. McDonald,
Homer Judd,	S. M. Cummins,	A. W, French,
W. E. Magill,	H I. Chandler,	R. Russell,
F. J. S. Gorgas,	A. L. Northrup.	

The Report of the Committee of Arrangements was then presented, as follows:—

The Committee of Arrangements would respectfully report that they have made such arrangements for the accommodation of the Association as were in their power, and that they have received the names of the following persons as delegates from their several Societies.

American Academy of Dental Science, Boston:—Drs. H. F. Bishop, Daniel Harwood.

American Dental Convention:—Drs. J. G. Ambler, C. S. Weeks, and A. Starr.

Boston Dental Institute:—Dr. C. E. Pinkham.

Boston Dental College:—Dr. I. J. Wetherbee.

Brooklyn Society of Dental Science and Art:—Drs. W. H. Atkinson, F. W. Dolbeare, E. L. Childs, M. E. Almendorf.

Brooklyn Dental Association:—W. H. Allen.

Buffalo Dental Association:—Dr. J. H Giffing.

Beaver Valley Dental Association:—Dr. H. J. Chandler.

Connecticut State Dental Association:—Drs. R. C. Dunham, H. L. Sage.

Connecticut River Valley Dental Association:—Drs. J. J. Vincent, O. C. White.

Chicago Dental Society:—Drs. Geo. H. Cushing, S. B. Noble, J. S. Marsh.

Dental School of Harvard College:—Dr. George T. Moffat.

Delaware Dental Association:—Dr. E. Shelp.

Hartford Society of Dentists:—Dr. J. H. McManus.

Hudson River Valley Dental Association:—Drs. L. S. Straw, T. C. Royce.

Harris Dental Association:—Dr. J. W. Derr.

Indiana State Dental Association:—Drs. W. F. Morrill, G. A. Wells,

Illinois State Dental Association:—Drs. C. K. Sawyer, W. W. Allport, A. W. French, M. S. Dean, H. J. Smith, G. V. Black.

Iowa State Dental Association:—Dr. John A. Mason.

Lake Erie Dental Association:—Drs. J. C. Gifford, B. Rathbun, J. Danforth, W. E. Magill, G. B. McDonald, W. T. Wallace, A. B. Robbins.

Maine Dental Society:—Dr. A. K. Gilmore.

Merrimack Valley Dental Association:—Drs. G. A. Young, Thos. Palmer.

Massachusetts Dental Association:—Drs. L. D. Shepard, F. Searle, J. T. Codman, F. H. Chandler, T. B. Hitchcock, I. A. Salmon.

Mad River Valley Dental Association:—Dr. S. C. Taylor.

Michigan State Dental Association:—Dr. J. Douglas.

Mississippi Valley Dental Association:—Drs. Wm. M. Hammond, A. L. Evans.

Missouri Dental College:—Dr. Homer Judd.

Missouri State Dental Association:—Drs. H. J. McKellops, W. N. Morrison.

New York State Dental Society:—Drs. Peter Sloan, William Carr, A. Westcott.

New York—First District Dental Society:—Drs. W. A. Bronson, A. L. Northrup, C. E. Latimer, J. A. Bishop, M. L. Chaim, F. Heindsmann.

New York—Third District Dental Society:—Dr. J. C. Austin.

New York—Fifth District Dental Society:—Drs. L. W. Rogers, H. A. Coe,

New York—Seventh District Dental Society:—Dr. H. S. Miller.

New York—Eighth District Dental Society:—Dr. M. B. Straight, L. C. Squire, A. C. Crysler.

New York Odontological Society:—Drs. E. A. Bogue, Charles E. Francis, Wm. C. Horne.

New York Dental College:—Dr. N. W. Kingsley.

Old Colony Dental Association:—Dr. C. G. Davis.

Ohio State Dental Association:—Drs. H. C. Howells, C. H. Harroun, T. W. French, A. W. Maxwell, H. M. Edson.

Ohio Dental College:—Dr. J. Taft.

Ohio Dental College Association:—Dr. H. A. Smith.
Philadelphia Dental College:—Dr. J. H. McQuillen.
Pennsylvania Dental College:—Dr. T. L. Buckingham.
Pennsylvania Dental Association:—Drs. John H. Githens. Amos Wert, W. Smedley.
Saint Louis Dental Society:—Dr. Edgar Park.
Western New York Dental Association:—Drs. S. A. Freeman, L. J. Walter, L. F. Harvey, G. C. Daboll, R. G. Snow, C. W. Stainton, J. G. Barber, L. R. Leach.
Wabash Valley Dental Association:—Drs. J. S. Smedley, A. M. Moore.

Respectfully submitted.

Some exception was taken to that portion of the report having reference to the delegates from the American Dental Convention. With this exception the report was adopted.

On motion of Dr. Wm. C. Horne,

Resolved: That the credentials of the delegates from the American Dental Convention be referred to a special committee to determine whether that Convention is entitled to representation in this body; committee to be appointed by the president, and to consist of five persons.

Committee, Drs. Horne, Spelman, Morgan, Cummings and Robbins.

On motion of Dr. B. T. Whitney,

Resolved: That all Dentists, Physicians and Clergymen residing or visiting in this vicinity be hereby invited to seats during the sessions of the Association.

Dr. A. W. French requested all persons having written essays to compete for the prizes offered by the American Dental Association, to present them to the committee on prize essays as soon as convenient, for examination.

The following members were reported as absentees, who had sent their dues:

Drs. James Knapp, S. M. Goode, W. W. Sheffield, S. D. Stewart, C. S. Stockton and S. J. Cobb.

On motion,

Resolved: That the Association now proceed to appoint a committee on nominations.

Committee appointed as follows:

Drs. H. F. Bishop, W. W. Allport, W. F. Morrill, L. D. Shepard, H. J. McKellops, J. H. McQuillen, A. L. Northrup, W. P. Horton, T. Moffatt, to report at the meeting this p. m.

Adjourned to meet at 4 o'clock p. m.

FIRST DAY—AFTERNOON SESSION.

The Association was called to order at 4 o'clock by the president.

Minutes of the morning session read and approved.

The committee to whom was referred the credentials of the delegates from the American Dental Convention made their report as follows:

Mr. President: Your committee beg leave respectfully to report that they have carefully considered the subject referred to them, and have arrived at the conclusion that the American Dental Convention is not a local organization as contemplated in your constitution; and therefore not entitled to representation in this body. The committee are happily relieved from any personal bias in this matter by the fact that all the gentlemen appointed as delegates from the American Dental Convention are either members of this body, or members of some local society, whose delegation here present is not full, and to which any of them may be easily added. The American Dental Convention antedates the American Dental Association, and the reasons which demanded the organization of this Association in contradistinction to the Convention still hold good. Your committee understands the main object of this association to be the indefinite increase of its membership, this being precisely the point of departure between this Association and the Convention.

Every Dentist being entitled to membership in the Convention on the single condition of the payment of one dollar, sufficiently proves it to be not a local society, and the admission of delegates from such a body on the ratio of one delegate to five members would be a virtual surrender of the representative character of this body, to be carried into full effect as rapidly as the easy conditions became known. Your committee resting entirely up-

on the Constitution construed in the light of well known facts, offer for your adoption the following resolution:

Resolved: That the American Dental Convention, not being a local organization, and having no condition of membership other than a pecuniary one, is not entitled to representation in this body.

W. C. Horne,
B. T. Spelman,
E. G. Cummings,
A. B. Robbins.
} Committee.

The following report by another member of the same committee was then presented:

Mr. President: I dissent from the majority, and believe the American Dental Convention to be entitled to representation for the following reasons:

1st. This Convention works under a Constitution as other associations do.

2nd. It is self-perpetuating, and adjourns from place to place.

3d. It does not adjourn *sine die* as Conventions properly so called do.

Very Respectfully,
W. H. Morgan.

The minority report was adopted.

The nominating committee now presented the following report: for

President, Drs. J. Taft, of Cincinnati; W. H. Morgan, of Nashville, Tenn.

1*st Vice-President*, Drs. Homer Judd, of St. Louis; C. E. Francis, New York.

2*nd Vice-President*, Drs. A. A. Blount, of Springfield, Ohio; I. A. Salmon, Boston.

Corresponding Secretary, Drs. J. McManus, of Hartford; M. S. Dean, of Chicago.

Recording Secretary, Drs. W. C. Horne, of New York; Edgar Park, of St. Louis.

Treasurer, Dr. W. H. Goddard, of Louisville, Ky.

The report was accepted.

The election of officers for the ensuing year was now announced as the order of business.

The President appointed Drs. W. A. French and A. B. Robbins as tellers.

Upon ballot, the following gentlemen were elected:

President, J. Taft, Cincinnati, Ohio.

1*st Vice-President*, Homer Judd, St. Louis, Mo.

2*nd Vice-President*, A. A. Blount, Springfield, Ohio.

Corresponding Secretary, J. McManus, Hartford, Conn.

Recording Secretary, Edgar Park, St. Louis, Mo.

Treasurer, W. H. Goddard, Louisville, Ky.

On motion, adjourned to meet to-morrow, July 29th, at 10 o'clock a. m.

SECOND DAY—MORNING SESSION.

Association met pursuant to adjournment. Being called to order by the President, prayer was offered by Rev. — Barnes.

Drs. W. P. Horton and C. G. Davis were appointed to escort the President elect to the chair, who, upon assuming the position was most enthusiastically received by the Association, to whom he briefly expressed his acknowledgments for the honor conferred, his sense of the responsibility attending the position, and his confidence in having the aid and encouragement of the Association in the position he was about to assume. After counseling the members to enter upon the work before the Association with earnest hearts and willing hands, the recording Secretary elect was called upon to discharge the duties of his office.

Dr. Lawrence in retiring from the chair, presented the following address:

Mr. President and Gentlemen of the American Dental Association: According to custom I suppose I may consider myself called upon to offer a few as appropriate remarks as my abilities will permit, on the occasion of leaving the chair to which your kind partiality called me, and in which you have now placed a most worthy successor, and one able to fill it with dignity and honor both to the Association and to himself.

Permit me to thank you for past favors and predilections, and

to request you to give me a willing ear for a few moments while I call your attention to a few such matters as seem specially connected with the interests and prosperities of our Association.

We meet here to-day under the most favorable auspices, harmonious and prosperous, so let our assemblies and relations ever be maintained to our mutual benefit.

There is no such thing as independence in this universe, and the man who best understands his relationships and dependencies is in the best condition to enjoy the best of life.

American Dentistry—scarcely two and a half score years of age—has risen from its humble origin, and become a highly respectable power for good throughout the country. At first it was confined to, and practiced by, a few cunning and ingenious workmen, who devised their own plans, instruments and materials, and did the best they could under the circumstances and conditions of their isolations. But such conditions no longer clog and retard us. Now, by concert of movements, by science and association, we have arrived at highly commendable respectability for our attainments, and for the beauty and usefulness of our manipulations. Much of this is due to professional courtesy and kindly associative action.

The praiseworthy success that has attended our unwearied efforts for improvement is a matter of which we may well be proud. Dentistry has kept pace with the reform movements of the age, and now claims to be a profession, the peer of any other. It has taken due and rational thought of what it should say and do, and now manifests the benefits.

With increased numbers came increased science, power and responsibilities; once "weighed in the balance and found wanting," it has now grown corpulent and symmetrical, and can speak, act and manfully justify itself. In our untiring efforts to raise our profession to its present dignified and exalted position, we have done nobly for ourselves and for society. Our object has been, and I trust will continue to be, to attain to the greatest usefulness and perfection in our indispensable vocation. Let us be governed by the exalted principles of truth, right and justice, and so rise above all narrow-minded selfishness to the lofty con-

sideration of universal good and benefit. It has come to be thought that the Dental is an indispensable profession, for no man or woman can be a "glorification of God" without beautiful teeth, and a healthy digestion, to which these so greatly contribute.

Then it follows as a logical sequence, that we work diligently for the gratification of both God and humanity, by contributing so extensively toward sustaining a beautiful and dignified humanhood. Is it possible for us then, in view of our weighty responsibilities, to rest and sleep quietly unless we are fully competent to our task?

All human souls must have their trials, losses, crosses, woes and calamities, and each one must judge of its own faithfulness, or short comings, and so measure its own joys and sorrows.

All Societies, Lyceums, Associations and the like, are composed of individuals numerous enough for the particular purposes of their association. Where the population is too sparse for the purpose, such organizations are seldom met with, and the want of society is often a serious inconvenience, to say nothing of the damages accruing thereby. In cities, and thickly settled towns, civil, scientific, religious, social and other organizations, are more easily formed and sustained.

In such places these are considered indispensably necessary for securing and perfecting our inalienable rights, namely, "life, liberty and the pursuit of happiness," by diffusing knowledge and instigating the people to the acquisition of the science of life, the most important result to arrive at, by obtaining a knowledge of the physical sciences. Without a knowledge of these, and their legitimate results, but little satisfactory progress can be made.

The members of any profession, too widely scattered, find it difficult to keep up with the discoveries of science, and so obtain that skill in workmanship which renders them confident of their abilities for success, and to meet on even terms with their more favored brethren. Isolated practitioners are apt to fall into methods, manners and customs of their own, which are liable to imperfections, recognizing no code of ethics or practice; being

mostly a law unto themselves, and no one may, without due ceremony, question their lack of attainments, or fail to commend them for their lack of judgment; but as the demand for professional men increases, these evils will, in some measure, be obviated, more and more the benefits of association will be perceived, and the members will not only profit themselves, but be enabled to render more and greater benefits to the community at large.

The Dentist should be a man of nerve, skill, sound judgment and honesty, for he is called upon to relieve excruciating tortures by severe remedies, as well as to repair calamities, defects and losses. Fifty years ago the Dentist might be a cunning man, and a genius, but he could perform little or no commendable service. His professional merit looks to us at this time of rather doubtful quality. Such primitive line of operations is still pursued in many parts of our country as brazen faced as ever, and as defiant of reason and the best of common sense. In proof of this, we need only consult the untruthful advertisements scattered through the length and breadth of our extensive country. But such operators sustain about the same relation to the true Dentist as did the barbers of "ye olden tyme" when they added to their vocation that of tooth drawing and phlebotomy, to the most accomplished surgeon of modern times. We hope to see science and skill remove all quackery, and all bungling operators from our borders, and bring out instead all the capabilities of our profession.

Noble exceptions to the primitive type of operators have here and there been found, whose works, words and worship were an honor to them and their profession. They were compensations for great quantities of delinquencies and inefficiencies. Such men are worthy pioneers and shining lights, and an honor to their profession. They are capital media for the transmission and diffusion of correct principles. They inaugurated Dental Associations, and set the car of progress in motion, for which laudable work we have to honor and respect them.

Among the earliest organizations in our profession, and I believe the first claiming to be national in character and purpose,

was the American Society of Dental Surgeons. Its constitution and by-laws were such as, in the judgment of its founders, would in the best manner secure the great object in view, so desirable of attainment. Yet they were of necessity less expansive and far-reaching than the same men would institute and promulgate to-day. So it ever is in all initiatory steps taken in such directions. The old "Blue Laws" of Connecticut were considered well adapted to their time and place; perhaps they were, but it is difficult for us now to imagine any such time or place on this continent or any other.

The mandates and required pledges of the society in question were intended to correct certain practices and abuses which were thought pernicious, and threatened to become too widely prevalent. No society of our profession was ever organized by better men, nor men influenced by purer motives, than were those of whom I would make honorable mention. Yet it was intolerant of opinion, which was its apparent fatal mistake, expressed in over-abundant legislation, which is not education; nor can it, if sumptuary in character, entail any advantage upon the members of scientific or other associations of men; for the consent of the governed is an important element for consideration in the art of governing. These remarks will apply to other and later times, yet not, I hope, with equal force. The American Society was necessarily aggressive, as all societies claiming to be reformatory must be. It was a good ship designed for deep waters and long voyages. Manned with a hardy crew, and supplied with suitable armament, proudly she ploughed the muddy waters of ignorance and empiricism. All would have been well had not the over-confident crew in an evil hour, and in the teeth of adverse gales, attempted to double cape Prejudice, where she run aground on Amalgam shoals, and became a total wreck, the waves of 1856 (Aug. 7th) closing over the gallant craft forever; most of the crew, "big guns" and log book were fortunately saved. I leave the American Society to the memories of its friends, with the hope that its virtues may be emulated, and its failings, if any it had, may serve as an admonition. The

progressive minds of our specialty were true to their original purpose, and foreseeing the dissolution of the Society to which I have just referred, resolved not to abandon their efforts for the improvement of Dental science and art, and accordingly in July, 1855, united in a call for a convention of the Dentists throughout the Union, to meet in Philadelphia, on the 2nd day of August of the same year, at which time and place the American Dental Convention was duly organized upon a plan sufficiently liberal in its conception, and free from that spirit of dictation which unfortunately had crept into the American Society. This Convention is still in existence, and meets annually at such times and places as at each session may by vote be appointed. To its ministrations I leave the Convention, and trust its founders and members will secure an adequate reward in the reflection that some good has been the result of its life and conduct. Closely following the formation of the "Convention," a desire became manifest for an organization upon a basis promissory of greater advantages and benefits, both as regards perpetuity and usefulness, than either of the bodies to which allusion has been made.

Therefore, on the 3d of August, 1859, pursuant to a memorial previously published, some twenty-six "good men and true," representing eight local Societies and two Dental Colleges, assembled here on ground hallowed and made fitting by the God of nature, for good and great deeds, and proceeded, pro forma, to inaugurate the American Dental Association into the family of progressive institutions.

A provisional organization was at once accomplished, Dr. W. W. Allport being called to the chair, and Dr. J. Taft was chosen secretary, which office he has acceptably filled ever since. No commendatory expressions of mine can add aught to the high estimation in which both these gentlemen are justly held by the profession for their attainments, their sterling qualities of mind, and zealous devotion to the cause of progression in our specialty. Gratifying as were the auspices under which our Association was established, a comparison with our present status ought to fill our hearts with just pride, as we contemplate the fact, that we

now embrace representatives from no less than nine Dental Colleges and some thirty-five local Societies, the latter with largely increased representation, and all with an undiminished professional zeal. At the preliminary meeting, to which allusion has been made, a Constitution, modeled upon that of the American Medical Association, was reported by a committee appointed for that purpose, but was recommitted "with instructions to mature and amend, if necessary, and publish in the journals as early as "the then" next November," for, as is supposed, the information of the members and all others interested. After the appointment of several essayists for the next meeting, the Association adjourned, to meet in the city of Washington, on the last Tuesday of July, 1860.

The Washington meeting was held in the Smithsonian Institute, and so far as I can learn, the proceedings were eminently harmonious. During the afternoon of the first day of this session a Constitution, reported by the committee selected at Niagara, was adopted, and the day following officers were elected under the same; Dr. Wm. H. Atkinson being chosen president. Immediately after the election, on motion of Dr. Fitch, the resolution adopting the constitution was reconsidered, for the purpose of introducing an amendment to article V, which relates to officers and their duties. The amendment prevailed, but I am not aware that the constitution, as amended, was adopted either at that or any subsequent meeting. I would here respectfully suggest, that the organic law of any literary or scientific body should be concise, so expressed as to be easily understood, and be subject to amendment, repeal, or open violation only upon grounds sufficiently grave and important to justify such action. Legislation is a growing evil, and the less we as an Association have to do with it, the more shall we promote the great objects for which we join hands and maintain our assemblies. A code of By-Laws for the Association was here adopted, and twenty-three names were then enrolled as members, being three less than were in attendance at Niagara the previous year. After the adoption of several resolutions expressive of the advantage and necessity of a collegiate Dental education, and advising "a

higher order of general literary and scientific education," as requisite to matriculation in Dental Colleges, the Washington meeting adjourned, to meet in the city of Cleveland, Ohio, on the last Tuesday in July, 1861. In consequence, however, of the disturbed condition of the country at that time, the president, by and with the advice of prominent members, very properly postponed the meeting in Cleveland to the year 1862, of which action due notice was given. Of this meeting, fortunately for your patience, I have no data upon which to predicate remarks, further than to say that Dr. Geo. Watt was chosen president, and that it adjourned to meet in Philadelphia in 1863, at which time and place the session was more successful, in point of numbers at least, than were any previous, but of this meeting I am again without data, yet I indulge the fond hope that my life may be spared long enough to see the full transactions from the first meeting down to the present, published and delivered to our members, so that all who desire may learn more definitely of our life and experiences. Dr. W. H. Allen was chosen president at Philadelphia, and some changes were proposed in the constitution, respecting the number, and mode of selecting the nominating committee (which changes were adopted at the next session), after which, and the consideration of the usual business, this place was again selected to welcome our convocation, by the majestic cadence of its mighty torrents, whose constant flow admonishes us that we too are passing on.

Our Association had now passed through its experimental days, and stood, so far as Dental science and art are concerned, where it now stands, the pride of its members, and the hope of the nation. Its vigorous branches now overspread the land, and thousands find shelter, shade and protection beneath from the siroccos of empiricism, that else would sweep, as with a besom, to destruction all that is worth maintaining of our noble calling. Material aid in defining the boundaries of our profession has lately been rendered by the Legislative Assembly of the State of Ohio, in the passage of an Act, entitled an Act to regulate the practice of Dentistry. By the provisions of this Act, no

one can commence the practice of Dentistry, for compensation, in the State of Ohio, unless endorsed by a diploma from the faculty of some regular and duly incorporated Dental College, or a certificate of qualification from the State Dental Society, or some of its auxiliaries, without being regarded as guilty of a misdemeanor, and be liable to a penal assessment for the benefit of common schools, of not less than fifty, nor more than two hundred dollars. The hand-writing on the wall, "Jan. 1st, 1873," appears sufficiently facile of interpretation, that those now in practice in that State can scarcely fail to understand, and act, not only wisely but manfully, in converting a compliance with the law into a pleasurable duty. All praise to Ohio! God bless her, and all within her borders for this advance movement so long needed, and which will, I hope, be repeated in every State in the Union. I award the palm to Ohio for having made the greatest improvement in Dentistry, and for publishing the best prize essay on our specialty extant.

New York has put her shoulder to the juggernaut of progress, and it is to be hoped that all the available instrumentalities, legal and educational, will be brought into requisition, to crush out of existence all quackery and imposition, that our land may blossom in the sunshine of science, and bring forth fruits worthy of our enlightened age.

Mr. President, the present is, par excellence, an age of progress, and highest and most important scientific discoveries. Its faith is not the faith that through the foregone ages was satisfactory and thought sufficient. It has eyes and ears, and trusts in the evidence of its senses. It is an age of illumination and great events, it lays manly hold on things now, that were once only dreamed of and hoped for. Who now can fail to consider it a glorious privilege to be born for and live in such an epoch, and to enjoy communion with its deep thought, and its most developed teachers? This is an age compulsive of deep thought, and earnest reflections. The grandest results of truths, many of them long ago promulgated to the dull senses of misunderstanding, are now clearly seen, understood and acknowledged on every side. How to understand and obtain the benefits of these,

should deeply concern every human soul. All causes may now be freely and fearlessly probed to the core, by suitable instruments, guided by sufficient intellect and reason. This is the age long waited for, yet sure to come; of this prophets have foretold, and for this humanitarians have waited, and in it they are now rejoicing. A man is now just what he can prove himself to be, and mere pretentions and professions can no longer be sanctioned and recommended. All things are up for scrutiny and close examination. No closed questions now to shape ourselves to, all are laid open for investigation, are fearlessly challenged, and required to render true accounts of themselves, by serious and inevitable questioning.

We are living, we are dwelling
In a grand eventful time,
In an age on ages telling,
To be living is sublime.

That the marvelous lessons of the age may be transferred to our understandings, that our own experiences in life, professionally and otherwise, may temper our conduct, and stimulate us to greater attainments and usefulness, and thus render us better and happier here and hereafter, is my most sincere wish and personal aspiration.

The Treasurer's report being called for, the following was presented:

W. H. GODDARD

In Account with the American Dental Association. *Dr.*

To cash received for dues for 1865	$ 28 00
" " " " " 1866	135 00
" " " " " 1867	816 00
" " " " donation	5 00
	$984 00

Cr.

By paid several bills, as per vouchers herewith	$884 01
Balance on hand	99 99
	$984 00

Respectfully submitted.

W. H. GODDARD,

Treasurer American Dental Association.

On motion of Dr. Horne, the report was accepted, and on motion of Dr. Atkinson, referred to an auditing committee.

President appointed as auditing committee, Drs. E. A. Bogue, W. H. Morgan and S. B. Palmer.

On motion of Dr. Goddard,

Resolved: That a committee of five be appointed by the President, to revise the roll of members of this Association, and report such action as may be best in regard to those who refuse to pay them, and suggest such further action as will expedite the payment of annual dues; also to recommend what course is best, in regard to the transactions of 1865 and 1866, some members having paid only one of the year's dues.

Committee appointed, Drs. W. H. Morgan, W. W. Allport, I. J. Wetherbee, John Allen, W. H. Goddard.

On motion of Dr. McKellops, the order of business was suspended, to allow Dr. Westcott an opportunity of presenting to the Association models of an interesting case of irregularity, and of explaining the means by which it was corrected.

On motion of Dr. Wetherbee,

Resolved: That the thanks of this Association are hereby

tendered to the retiring officers, for the able and acceptable manner in which they have discharged their duties.

On motion of Dr. Sage, members of the press, resident or visiting in this vicinity, were invited to seats in this body during its sessions.

President appointed Drs. Sage and Wetherbee committee on invitations.

Dr. Whitney offered a resolution, instructing committee of arrangements to admit to membership in this Association delegates from Dental Associations, from the Board of the Royal College of Dentists, in Ontario, Canada, and from any other regular Dental Association in that dominion.

Dr. Shepard raised a point of order, objecting to the adoption of the resolution, on the ground of unconstitutionality.

Point of order sustained by a vote of 60 to 25.

On motion of Dr. Westcott,

Resolved: That Dentists from Canada be invited by this Association to the privileges of the floor during this annual meeting.

On motion of Dr. McQuillen, seconded by Dr. Horne,

Resolved: That a committee of three be appointed to examine the report of the committee of arrangements, and ascertain whether those presenting credentials are all practising Dentists, and if there have been any informalities with respect to the reception of delegates.

Committee—Drs. J. H. McQuillen, W. H. Horne, W. W. Allport.

Adjourned to meet at 3½ o'clock p. m.

SECOND DAY—AFTERNOON SESSION.

The Association met pursuant to adjournment. President Taft in the chair.

Minutes of the morning session read and approved.

Dr. Sage, chairman of committee on invitations, reported that invitations had been extended to certain members of the press, who desired the conveyance of their thanks to the Association, regretting their inability to attend.

A resolution was offered by Dr. J. A. Perkins, reciting that

Dr. C. P. Fitch, of New York, had violated the code of ethics, and moving that his name be erased from the roll of membership —Referred to the committee on ethics.

The chairman of the auditing committee made the following report:

Mr. President: Your auditing committee, to whom was referred the Treasurer's report for this year, hereby report, that they have examined the vouchers and accounts of the Treasurer, and find his books not only correct, but in such order that the pecuniary standing of each member in relation to the Association can be ascertained at a glance, as well as the pecuniary status of the Association, and that the thanks of this body are due to Dr. Goddard for his very efficient performance of the duties of his office.

Niagara, July 29th, 1868.

E. A. Bogue,
W. H. Morgan,
S. B. Palmer.

On motion of Dr. Wetherbee,

Resolved: That a committee of three be appointed by the chair, to consider the extent of the duties and labors of the Treasurer, and whether such labors merit compensation.

Committee—Drs. I. J. Wetherbee, B. J. Spelman, T. L. Buckingham.

On motion of Dr. Wetherbee,

Resolved: That we now proceed to appoint the place of our next annual meeting. Action upon this resolution resulted in the selection of Saratoga.

Dr. McQuillen, chairman of committee appointed to investigate the report of committee of arrangements on credentials, reported the following:

Mr. President: Your committee, to whom was referred the following resolution, beg leave to report: That they find, from the best information they have been able to obtain, that the delegate from the Delaware Dental Association is not a practising

Dentist, and therefore, in accordance with the first clause of the first article of the constitution, not entitled to membership.

Your committee also find that certain gentlemen here present, claiming to be permanent members, have retired from practice, and are therefore not now entitled to membership, in the opinion of your committee.

Your committee, after a calm, careful and dispassionate examination of the claims of the delegates from the American Dental Convention, are of the opinion that that convention is not entitled to representation in this Association.

Your committee further recommend the adoption of the following resolution:

Resolved: That hereafter, the form of certificate for delegates to this Association shall be as follows:

This certifies that————was duly appointed a delegate to the American Dental Association, on the——day of——18— by the Dental Society of————, and that said———— is a Dentist of good character and standing; and at this time in regular practice.

And that the Secretary be hereby instructed to publish this form of certifieate in all the Dental journals.

All of which is respectfully submitted.

J. H. McQuillen,
W. C. Horne,
W. W. Allport. } Committee.

On motion, report was accepted.

On motion, each paragraph was separately voted upon by the Association, and the last two adopted, viz., the form of certificate to be hereafter presented by delegates, and instructions to the Secretary to publish same in all the Dental journals.

On motion, the committee was discharged.

On motion of Dr. Atkinson,

Resolved: That a committee of three be appointed to revise the Constitution and By-Laws of the American Dental Association, and report at this meeting.

The following gentlemen were appointed by the President to operate at to-morrow's clinics:

Drs. Latimer, Shepard, Southwick, Wetherbee, Butler and Harroun.

On motion, adjourned to meet to-morrow at 10½ o'clock a. m.

THIRD DAY—MORNING SESSION.

Association convened at 10½ o'clock, President Taft in the chair. Meeting opened by prayer by Rev. Mr. Barnes.

Minutes of last meeting read and approved.

The President appointed the following committee on the revision of the Constitution and By-Laws:

Drs. E. A. Bogue, W. H. Morgan, W. H. Goddard.

On motion of Dr. John Allen, the regular order of business was suspended for twenty minutes, in order to allow Dr. Kingsley to explain to the Association improvements in method of constructing appliances for congenital cleft palate.

Dr. Kingsley said,—

Although I have been limited to twenty minutes, I think I have schooled myself within the last year or two, so that I can go over the ground in that time. I am not here, except by invitation of the Association. It is not for my own benefit. If it is a pleasure to the Association, I present it for your gratification, and not for myself. In regard to this matter, I would state, that the general subject of congenital cleft palate has been before the Dental profession for some years past, and has been pretty thoroughly gone over. At the time it was presented two years ago, in Boston, I told the Association all that I then knew and could tell. Since that time, however, I have made improvements, now as far in advance of what I was then, as I was then in advance of almost nothing. I wish the Association to understand I speak on the subject of *Congenital* Cleft Palate, I do not speak of acquired disease; I wish to make this distinction clear in your minds, because it makes a very great advance in the profession to what has been done. A man who has lost his palate by disease, may have it replaced, so that he can speak instantaneously upon the application of the fixture, almost, if not quite as well as before the defect occurred.

There is one matter in connection with this thing, which has been of interest to all, and I presume is still, and that is the matter of taking impressions. This matter of taking impressions is really just as simple a matter as it is to take any ordinary cast. The impression is taken in this manner: In the first place, an impression is taken in the ordinary impression cup, with plaster, on that plaster model a gutta percha form, with a piece of hard wood for a handle, was made, and on that form a thin film of plaster paris was placed and carried back into the mouth where it belonged; thus I have a correct impression of the lower cavity with the plaster, extending from the posterior edge of the soft palate up to the hard palate. This impression is removed from the mouth, and, at the same sitting, all of the cavity above the fissure is filled with ordinary plaster with the same instrument, a little spatula made out of hard wood. While the plaster in this part of the upper cavity is soft, the impression already taken is carried up to its place, the two brought in contact, and whenever the upper part is set, the lower part is removed, leaving the upper part in position. With a pair of tweezers the back part of this cast is seized, the mass drawn out of the mouth, and the two pieces are put together. This is just as I do in all such cases, and there is no more difficulty in doing it than in the description of it.

Now for the improvements, which have been these: Two years ago, I demonstrated to the American Dental Association, in Boston, as has already been stated, what I had done up to that time, constructed an artificial palate for congenital cases, which would enable the patient, with practice, to speak perfectly; a palate that will accomplish this result is all that any instrument can do. I do not think that in that respect anything will ever be made that is any better, because the patient has got to learn to use it, and here is the improvement,—the means by which such an instrument as that can be produced. The first instrument I ever made produced that result, but it is in the simplification of this instrument, from that time to this, wherein the improvement lies. At the time I was making this instrument, it was made in a mould, and this is the very mould (showing mould). It is made

of type metal, and consists of four pieces, and, gentlemen, it is a nice thing to do. It is a nice thing to fit all these parts together, and to make, as the result, a fixture that should be delicate in its nature, and worn without any irritation whatsoever.

I have reduced that matter to this simple form. I have a brass flask here, (which may be made of iron or anything else,) which is in two pieces; there, gentlemen, is a mould made in the flask; it is not essential that there should be as many flasks as there are moulds, for the reason that I can knock the mould out of the flask, and use it for another cast, so that one flask will answer for as many casts as you wish to have. In this flask all I have to do is to take the rubber adapted to the purpose, and as easily as you would take a cast for another set of teeth, I clap this in the mould, as you are all accustomed to do, and vulcanize it, and the result is, that I have a palate which will answer every purpose, and which is identical in form with the palate that I have before made. Any one can accomplish these results.

Now, gentlemen, here is an artificial palate of the same form, made in a four pieced mould, and here is one made in a two pieced mould. This palate is made in two pieces. This palate, that I have in my hand, is made of hard rubber, although, if it was to be worn in the mouth, it would be made of soft rubber. When it is placed in position, it necessarily needs a fixture to attach it to the teeth and hold it in place. That fixture is before me, it being a bolt with a head on it, to attach it to the other portion, and hold the two pieces together.

I have here an artificial palate, made in the flask, in the same way I have described, which is identical in form precisely with that palate which was made in a four pieced mould. The mould itself was made by my assistant, not by myself, in less than one hour from the time that I gave him the mould, while it would take him a great many hours to make a four pieced mould which would produce precisely the same result. That is the improvement,—my assistant in one hour's time will accomplish what I used to take days for.

But here, I have still another thing, which is vastly superior to anything that I have before presented to you, and I am for-

tunate in being able to present this particular fixture to you. It was made for a lady more than two years ago, duplicates were made, one of them showing no upper teeth, there being no teeth in her upper jaw. I made her two sets of teeth, one upon platina plate, continuous gum work, and the other on gold plate. The teeth on the gold plate were attached by vulcanite. This is the second plate I have made for her within a few weeks past. She sent it to me by express, saying that she had observed that the front teeth were beginning to start off from the plate, and requested me to repair it. I am now able to present to you the piece, which has been worn for over a year; it bears its own evidence, as you will see.

Now, while in this other case, as you will see, the mould has been necessary to make a palate which could be worn; I here have the means by which, in extreme cases, the patient is totally independent of me and all moulds, to such an extent that if these plates, which have been made expressly for her, had given out, she can take the ordinary sheet rubber, that is to be found in the market, and cut out plates and attach them there, and is independent of me and all other Dentists. Now, gentlemen, I tell you plainly that I take considerable pride in that fixture. That very kind of fixture renders it possible for me to take the same fixture and apply it to scores of cleft palates, and I have done it. I do not need, therefore, to go to work and make a mould for each particular case, and if I am driven to desperation, I cut the plates out of any ordinary rubber that I can buy, put it into the mouth, and the patient is independent of me. It is better that these plates should be made expressly for it, but it is so contrived that one cast of them will make plates for scores of cases. I will say, as I said before, that this very appliance has rendered the application of this simple fixture an advantage, of just as much use to the patient as the other, so all that kind of cases may be treated in this way, and in a very few hours by a man who understands the business.

It was contended for in principle, and it holds good to this day, that the fixture must be made so that the muscles of the soft palate can raise it, and shut off the nasal passage. I contend

that that principle is essential to success in articulation. That principle I have always contended for, and have provided for it in this first fixture, and in all subsequent ones.

In this cast, here in the joint or framework which supports the plates, being made of gold and attached to the side of the teeth by the joint, which joint will occupy the locality of the junction of the soft palate with the hard palate. You understand here, that the joint keeps the hard palate stationary, while the soft palate is all the while moving up and down, necessarily so for articulation. Although it is made so that it can move up and down, it only goes down to a certain point. The soft palate never goes below a certain angle; my joint, therefore, will not drop below that point, for whenever the muscles of the soft palate are raised up they carry this little fixture up and down with it, causing the sides to contract, and thus it has every advantage, supplies every demand, and is superior to every other artificial palate that I have ever made, or that has ever been made.

Dr. Morgan, of Tennessee, wished to know if he understood that this was applicable to all congenital cases.

Dr. Kingsley: On general principles, I say yes. Any palate made of hard rubber, in a majority of cases—as many as ninety-nine in a hundred—a hard palate made for congenital cases will be a failure as compared with the palate made of soft rubber. I say this from the experience of scores of cases, where I have tried all sorts of experiments. In acquired cases a hard palate will do, but a soft one is better.

Dr. Ambler moved, that the time allowed Dr. Kingsley be extended.

Dr. Atkinson wished to know how he got a cast of this model, or impression.

Dr. Kingsley: I do not know that I could do it in any more precise way than by pouring soft plaster right over the flask, which is in two pieces, and this enables me to get this mould direct from the impression.

Dr. Atkinson asked how he got the mould from which he made his rubber cases.

Dr. Kingsley: Take some sheet gutta percha, or any plastic material, I use sheet gutta percha, and model it right from that. I now have a model of gutta percha, and with that model I go directly to this flask. Now you can see that it is perfectly plain and easy for you to get that impression; it is perfectly plain and easy for you to get that model from this impression. It is a simple thing for you to make a model in the form of this one, and it is just as simple a thing to take that gutta percha model and produce this flask, which shall duplicate it in rubber. These are the whole steps.

Dr. Buckingham, of Philadelphia, asked whether the mould he held in his hand was plaster or metal.

Dr. Kingsley: It is type metal. If you ask me how this mould is made, I can show you exactly. Suppose this fixture is in gutta percha, and has been made in this form on this plaster model. It is in two parts. These two pieces, which are ultimately put together. But let me say to you, if you are a beginner it would be easier for you to take your gutta percha and put it into a flask of plaster. Take out the gutta percha and introduce rubber in its place, because you can mould hard rubber more readily than gutta percha. Here then we will suppose you have duplicated it in rubber in the usual way. A small quantity of soft plaster will be poured into the bottom of this flask, just as you would any other flask for a similar purpose, and when the plaster is set they are removed. I have supposed them to be made of plaster. A ring made of iron is put upon the top of these and filled with sand, packed down. The ring is removed, the plaster is knocked out, the flask is brought against the sand, and opening the top, metal is poured in, the sand is removed, and this metal is then taken out. The two pieces are now replaced in position, now in type metal, before in plaster. This top part of the flask is filled with soft plaster, and then brought in contact with it. When set, it is removed. Here it is in plaster. The same process is used for the sand mould. It is made, separated, the plaster knocked out, type metal poured in, and the two are brought together, and I have my type metal mould.

It takes, as you all know, several hours to vulcanize this palate.

It would be desirable, therefore, if we could vulcanize severa, palates, duplicates of each other, at one and the same process. Now you can duplicate this plate easily; I will tell you how. Here I have these two pieces of the flask in type metal, which metal will melt at about five hundred degrees of heat. It is an easy matter for us to make a fusible alloy that will melt at about three or four hundred degrees. Let a ring be made which shall fit right on this part of the flask, so that when the ring is in position the two parts of the flask, the top and the bottom, are a half an inch or so from each other when the ring is in position. These rings are all just alike, so that you can set one ring on top of another, and extend it as long as you like. Supposing there is one ring in these, and I wish to use it; I will put a little soft plaster into this mould, bring it together, and let it set. The result is I have a plaster palate pattern, or mould. I will make two of them, two plaster palates. I will put one of them on the top part of the mould, and stick it down with the ordinary wax or anything else. I will bring the mould together with this ring between. The hole in the said ring enables me to pour in this fusible alloy, and I thus have the mould duplicated. I lay that ring aside and take another empty ring, and proceed in the same way, and just as fast as I can melt this metal and pour it in, is my ability to duplicate the power of my mould and extend these rings till you get as many as you like. Let me say that within one month I have made a palate for a gentleman who lives more than a thousand miles away, and I have duplicated his mould six times. I gave him four of these moulds, and kept two of them myself, and gave him some rnbber. Now, by that means, in case he loses his, or anything happens, I have two, by which I can still reduplicate it again. He has four of them, he has the rubber, and you can see for yourselves, gentlemen, that he can take that mould to any man who practices Dentistry, and if he makes any pretensions to practical Dentistry, it is in his power to take that mould and make him as many palates as he desires.

On motion a vote of thanks was tendered to Dr. Kingsley for his interesting explanation of his improved process.

The reports of standing committees were now called for, and the following report of the committee on Dental Pathology and Surgery, was read by Dr. W. H. Atkinson, the chairman:

REPORT OF THE COMMITTEE

ON

DENTAL PATHOLOGY AND SURGERY.

W. H. ATKINSON, CHAIRMAN.

LADIES AND GENTLEMEN: Will you permit me to request your undivided attention to the reading and delineation that I am about to present for your consideration. Allow me to earnestly request that in case any statement or doctrine is not clear to any, that they will call for a re-hearing, or make objections, that they may be answered in time to enable all to understand a subject that taxes the best powers of the best human intellects to fully and practically comprehend.

In consequence of delays beyond my control, I have been unable until this time to begin a report upon Pathology and Surgery, and I am only now, July 23d, 1868, 9 P.M., enabled to make this attempt through the great kindness and christian fraternity of a member of the profession who has really stood by me as a brother when unable to rise from my couch in consequence of a railroad injury, and gently led me out month after month supporting my tottering steps, until by the providence of God, I am enabled once more to proximate my normal movements. I refer to Dr. John M. Crowell, of New York City.

Inflammation being the principal doctrine and the prime minister of pathological activity, has led us to serious contemplation

and various discussions as to the existence, character and mode of expression, of the origin of this much vexed question.

In conversation at one of our meetings, Dr. A. Preterre made the remark that he had a hatching machine with which he had succeeded in the perfect incubation of many healthy chickens. At a subsequent meeting he broke three eggs at different stages of development; this so excited us as to call forth many remarks and queries upon the origin of organic being.

The doctor kindly offered me the use of his hatching machine for such experiments as I deemed proper to institute.

The experiments were commenced and we are now forced to discontinue them, and hence shall not be able to present in this report that which we had hoped respecting the origin, development and nutrition of the solids and fluids of the animal body.

Enough has been made apparent by these investigations to substantiate the pathological doctrine announced in my former reports, that pathology is but perverted physiology. For a slight variation of a few degrees of heat ranging below 95° and above 104° of Fahrenheit's scale was sufficient to prevent in the former and destroy in the latter the evolutionary movements of incubation.

"Evil communications corrupt good manners," among molecules as well as among men!

It is astonishing to what extents we go in our criticisms of others, while we are as good examples of the errors of which we complain as they to whom we deal anathemas with such a lavish hand.

The personal application of the doctrines we preach and the practices we commend to others will prove the best touch-stones to tell us where we belong, and what reception to expect in person and doctrine from those we desire to instruct or restore.

He who recoils with holy horror from ragged, blackened teeth, and pestiferous breath should be sure that he does not thus appear to his associates and patients, every time he speaks or laughs.

It is not an unheard of occurrence to come in contact with dentists whose words in speech and writing would lead us to hope

for better things, to be thus condemned when their own mouths and those of their families come under our close inspection.

"Judgment," it was said, "began at the house of God," that those who were set to instruct might be meet instruments of the work for which they were set apart.

And that the American Dental Association shall be the fit instrument of good, and only good, to the people and profession, all sycophancy and deference to the etiquette of position and pence must be made to give place to the attainment of wisdom, and the practice of good. That this may be secured we must be free in our investigations, and thorough in obedience to the requirements of the situation of understanding, interpreting and supporting, or supplanting by intelligent means the states in which we find the bodies and parts of bodies that are presented to us in the details of duty through its complicated range of principles and practice.

It requires deep conviction of our ignorance to ensure the sound conversion to clarity of mind and affection necessary to clear perception of the relations of force and form, the dual primates of function.

Physiological action can only take place in a wealthy body. Wealthy signifying well, and being the rootal sense of healthy.

The elements of health, well being or wealth to individual body are time, nature, mind, body, labor, which when in consentaneous movement produce riches. Pathological action is want of this consent of movement, or opposition one to the other, which produce poverty in the degree of their presence and force.

Force and form produce things. That things may be investigated to the fullest extent they should be brought before us. But in the absence of things we must have the representative of things to make our investigations.

To tabulate them in the order of nearness to or perfectibility of representation, we first take models, second pictures, third names, fourth initials, fifth abstracts, upon which to exercise our powers to deduce the being or thing, to enable us to answer the six questions, Why? What? How? When? Where? and Who?

The whole range of elements, physics, biology, noology, cos-

mology up to pantology must come within the grasp of our minds.

The elementary consisting of observation, language and mathematics.

Physics—consisting of astronomy, natural philosophy and chemistry.

Biology—consisting of vegetable, animal and human departments.

Noology—consisting of Psychology, sociology and THEOLOGY.*

Wealth of endowment is the basis of all physiological activity. Privity or loss of endowment, (poverty,) is the basis of pathological action. Thus the well are rich, and the sick are poor.

To get at the significance or meaning of pathological states, it becomes a necessity to understand these broad generalizations, to enable us to comprehend the meaning or significance of life and being in the individual sense, from atomic to systemic, or primary and simple, to final and complicated modes of existence and aggregation of primates of bodies, some definitions are imperative. The words meaning and definition, really express intention and limitation; purpose, purport, *tension*. design. Mean is the middle between two extremes. Tension, or stretching, is the effort to connect extremes without fracture of that which is stretched or held in a state of tension. In the simplest bodies the consentaneous tension of the currents of force and form are the tension of polarity between centre and surface, and constitute the intention and extension of these nutrient movements (circulation and breathing,) in their simplest mode of expression.

The essentials to this expression are body, blood and breath, which are but different degrees of differentiation of tension of spirit. Without body, blood and breath there can be no physiology or pathology.

The body is sustained by blood; the blood by breath; breath by influx from without; so that individual life and being is dependent and circumscribed by the nature of things so long as it holds identity or individuality.

The circulation in simplest bodies is afflux and efflux, diastole

* I am indebted to Dr. T. S. Lambert for the table.

and systole, taking in and throwing out. As we rise in the scale of organic being from this primal point of mode of life expression, amplification and complication multiply so rapidly and insidiously as to involve us in an inextricable confusion, if mental tension for one moment should let go its hold upon the concept of this initial of functional action (breathing). The tedium of tracing the grades of advancement from this beginning through all the stages of increment of life endowment, to the wealth of the magnificently endowed human kingdom, precludes, for want of time and space, our entering at this time upon the pleasant task.

The circulation in the human body, like that in the simplest body just described, is aerial, neural and sanguineous. The aerial is supplied from the surrounding atmosphere or air. The neural from the mucoid sea or juices of the flesh. The sanguineous from the chaotic mass of digested food, through absorption by the lacteals or absorbents whose mouths bestud the alimentary tract.

The ebb and flow of these tides of air, nerve mass, and blood in regular alternation constitutes the wealth of the body. The constituents of breath are, spirit, ether and gas; those of nerve blood are a compromise between these three, namely, spirit, ether and gas, chaos and granular mass, or the living matter of Beal. Those of the vascular blood are white and red corpuscles, and the liquor sanguinis, which contains within its grasp the earthy constituents of the human body. Thus then it is plain that the construction of the parts of the human body is but the degrees of differentiation or togetherness from spirit, ether gas, liquid and colloid to solids; each degree of togetherness limiting the freedom of motion, from breath to blood, colloid, bone, dentine and enamel; which last is so limited in the freedom of its constituent cells as to be a good example of inertia, or the statical nature of the constituents of the mineral kingdom—crystals. We are now ready to say that the inception of pathological state is the result of the privation of influx of congruous spirit, or the advent of that of an incongruous presence. Cleanness is the corelative of physiological activity; uncleanness (demoniac possession or obsession) that of pathological movement. Cleanness

signifies freedom from impurities; impurities are an admixture of diverse kinds of presence; wherever this diversity restrains the respiratory movement, the tension of *spirit* being changed, the *etherial* tension is also modified by unequal increment, that is propagated upon the *gas* that enters into the neural blood in the lungs, so as to alter the *magnetic* tension between it and the vascular blood, and deprive the arteroise positive blood of one degree of polarizing presence; and thus we have as the result, debilitated corpuscles, unable to build fully endowed and normal tissue, in a word, weakened elements of tissue. Impurities in food have their influence upon chymification, chylification and sanguinification so as to change the endowment of the globules and the liquor sanguinus from a plus to a minus quantity of life presence, which if not corrected by competent means must result in debilitated tissues, which renders the system susceptible to infectious disease. The moral affections are great modifiers of nutrient activity.

Cleanness of mind ensures placidity of affection, and consequent health. Uncleanness of mind disturbs the affections, and produces irregular breathing, that is propagated not only upon the blood column in the lungs, but transmitted to the alimentary tract, disturbing the peristaltic gyre, so necessary to the proper preparation of the chyle; and through it to the blood column in the whole vascular and neural systems, and thence to the sea of pabulum in the intercellular territories, where the "coup de grace" is put to finish the digestion of that upon which the cells themselves are fed, and from which they are formed, namely, pabulum juices of the flesh, mucous mass, nerve mass, living matter of Beal, granular matter.

Regularity and perfection of the nutrient acts are necessary to their proper performance.

That these may be secured, we must spontaneously obey the entire instincts of our natures, or be made cognizant of all the relations that can by possibility affect us, which last is making us infinite, and therefore are an impossibility. The vast majority of the race have essayed in the past to do this last, and hence have involved themselves and their posterity in a confusion of matter

and mind, intellect and affection, that inaugurated and vigorously maintains pathological and not physiological states of being of the human family.

All the forms of natural bodies that live in their normal states are devoid of pathological conditions, with the single exception of those traumatically induced in the struggle to maintain themselves in the dominion of the territories in which they are found, and to which they belong by original possession, or by the conquests of superior force.

That which is called civilization has been charged with the inception of pathological conditions. In one sense this is so. But it is only so by a misuse of the social elements in our nature by conceding the right to dominate to the intellect, rather than the instincts of being.

In fact intellect, intelligence is but the product of instincts matured and preserved in the receptacles of the mind, set apart to memory, and must be less spiritual than the inspirations of the moment.

Association among molecules and men tend to Divinize or Demonize each other in the ratio of the domination of affection, or intellect in the progress of life. Intimate associations tend to humanize and elevate men; while isolation tends to brutify and degrade the bigots who seek it.

Man, being the exact mean between seraph and silex, is made to partake of the nature of both; the first being the sample of force, and the second the sample of form; and hence there must be excess of influx above the need of each stage of differentiation of being that the efflux may possess enough of spirit to give it tether of its own parts, and polarity or affinities above and below. So that the debris of the higher becomes the pabulum to the lower in the scale of life endowment and individualization of force and form! If this last statement is understood, it will be easy to perceive the reason for the statement in a former report, that every planetary substance, according to its state of spirit tension, and the state of fullness or need of the body, might be a food, a poison or a medicine, (remedy.) Food contains affete and effete substances in variable proportions. When very rich

in recrementitious matter, the receptacles are small and simple, and excrement little in quantity and low in quality, approximating the mineral forms.

When food is poor in affete matters, the alimentary tract is great in volume and complicated in structure, with massive excrement of little consistence. If excrement be retained beyond the time of its becoming clearly of this character, it will be a poison in the ratio of its unfitness for the uses of the system ; or a sweltering hot-house for the production of entozoa and entophytes, or be metamorphosed into liquid, vapor, gas, ether or spirit, according to circumstances.

Thus running down the scale of togetherness, which had been ascended in the increment of endowment that made it food. There is no possible direct metamorphosis of one formed tissue into another.

All increment of growth of primal or anatomical elemental bodies takes place from chaos or pabulum, and hence to have the substance of one body contribute to the support of another, it must be made to pass the ordeal of destruction of its individuality by division and solution into chaotic mass, thus bringing it into a state of similarity of tension or irritancy to the type to which it is to be approximated as congruous constituent of the whole or acceptable assistance to abnormal growths already set up or about to be started in the body in some locality where debilitating conditions make it possible to do the malign work.

A serial examination of the facts and mode of the process denominated inflammation should be first considered in setting forth the doctrines of pathology. And this when completed will be the basis of all our indication of how to properly and profitably deal with breaks—lesions of the sort that require *surgical* treatment.

When pabulum has become debris in the system, and the locality is unable to throw it off in the ordinary methods of nutrient dispersive action, arrest of the normal ebb and flow of the pabulum in the inter-cellular territories is produced by the malign presence of the debris, which constitutes the first stage of the downward movement called statis.

I am aware that this term is usually held to signify stopping of the sanguineous flow in the vessels that circulate red blood; but I use it as arrest of the tidal movement in all the fluids concerned in the nutrition of the body, (and mind,) and think it should be confined to the territories in which it has its origin, and extend only as the condition is propagated from point to point involving in the case of phlegmon, first the juices of the flesh outside of cells, second the granular matter within cells, and third the formed material of cells and tissues to the extent of dominion of the aberrant force that produces the stasis. When stasis of the mucoid sea is established, the regularity of the flow in the capillaries of white and red blood or liquor sanguinis and globule is interfered with, and the greater mobility of the red globules causes them to pass through the centre of the lumen of the vessel, while the sluggish character of the white permits them to accumulate in the lymph space or periphery of the capillary calibre and make their way out of the vascular system into the intercellular territories, where they produce either hypertrophy of normal tissue, morbid products or degenerate into pus or sanies.

Those forms of food that are easily reduced to chaos need but a simple machinery to effect the production of the refinement of blood, properly called pabulum.

But those forms of aliment that are complicated in their elemental constituency, and held by very strong affinity of their elements, require a complicated and efficient machinery of digestive apparatus to effect the requisite chaotification to render them fit to become a part of the body into which they are introduced.

The varying circumstances then of mind, body and food are the measure of the regularity, or the irregularity by which bodies are produced and sustained in healthy or unhealthy condition.

The degrees of activity of nutrition can only accommodate themselves to definite limits of range of thermal change. Hence cold and heat of certain degree prevents or arrests not only the physiological but also the pathological activity of the human body.

Strictly speaking, the study of pathology includes debility, infection and contagion; and surgery, to be comprehensive and clear, involves all the methods and means of preventing and correcting the states induced by these. When this survey shall have been made, and fieldnotes brought to the home station, the competent clerk can make the equation, and then we become masters of the situation, and are enabled to diagnose the case, disperse the enemy, and by supplying the lack, thus communicate the impetus to organological movement on the upward scale to enable us to take in the blessed fullness of effulgence that emanates from the throne, in which ineffable blaze we shall be made to see as we are seen, and know as we are known.

ADDITIONAL

REPORT OF THE COMMITTEE

ON

DENTAL PATHOLOGY AND SURGERY.

BY DR. E. A. BOGUE.

In pursuance of the resolution adopted last year, as one of the committee on Pathology and Surgery, I hereby submit my portion of the report, begging the kind indulgence of the chairman of the committee and the members of the Association, for the shortcomings that must be evident. An unusually busy year has almost entirely precluded that desired and expected study of the subject which is due to one of so much importance.

The year has not been marked by many striking or brilliant

discoveries, nevertheless there has been a growing attention to, and interest in, the deeper matters pertaining to our branch of surgery, especially to that part of it which is conservative in its operation; and successes have crowned the efforts of earnest workers, out of all proportion to the amount of effort expended.

Microscopical investigation has arrayed equally earnest minds on opposite sides of the same question, if possible with greater assurance than heretofore, and thus research is stimulated, and experiment in the direction of supposed knowledge fostered, and all are gainers, for even by failure we learn, and oftentimes more impressively than by success.

The occupancy of the dentinal tubuli by nervous filaments is again asserted, and maintained on the authority of many microscopists, while their occupancy by nervous matter, but not nervous filaments, is as strenuously insisted upon by others; meanwhile efforts, persistent, and to a large degree successful, are being made to preserve alive and in a healthful condition the central pulp of the tooth after exposure and even inflammation have taken place.

It has been too long and too generally supposed, that owing to the extreme density, and low organization of tooth structure, the teeth were practically exempted from the operation of those reparative processes that are so visible in more vascular portions of the body; and it must be acknowledged that even the little that is known to the contrary of this view, is known to but very few, and the deductions that might be made from the records of cases, are not made, nor the principle sought after and applied in our every day practice as they should be, both for the temporary relief from suffering and the permanent immunity from the loss of or continual pain in their important organs. While, therefore, it is true that in the enamel there is no change of structure after the time of its eruption—so far as we can ascertain—and consequently no repair in case of its disintegration, this is not altogether true in regard to the dentine, whose tubuli so universally diminish in size from the deposition of calcific matter; that this operation is even recognised by us in the decreased liability to decay exhibited by adult over children's teeth; while in cases of

the preservation of the dental pulp, when nearly or quite exposed, those who have pursued the conservative course for any length of time may have noticed the gradual throwing out of calcific matter by the pulp, opposite the ends of those tubuli whose peripheral extremities have been infringed upon by decay or disintegration, so that after a comparatively short time in young subjects, the troublesome sensitiveness of the part is removed, ease takes the place of disease, and the operator has the satisfaction of feeling that he has been assisting and not thwarting nature's beneficent healing processes. Let it be distinctly understood that we are not seeking originality in any one, but that we *are* seeking to discover if possible the laws that govern, and the circumstances that modify nutrition, both normal and altered; and in these investigations, as in all the details of our daily practice, we shall deserve credit and we shall attain to valuable results through care, persistent, unremitting care. No single observation, nor even many observations on a single case can go very far towards establishing a principle for the treatment of all cases, but a careful record of all our cases with all their attendant peculiarities written down and compared among each other would be of incalculable value, and would aid the histologist in every step of his long and arduous journey over a short half inch of tissue.

It has not only been proven by carefully kept records, that during the last few years large numbers of exposed pulps have been kept alive and in good health, but it has heretofore been proven that calcific matter is almost invariably thrown out by the tooth pulp opposite those tubuli whose peripheral extremities have been exposed to disorganizing agencies.

Hence we may very reasonably infer, though we cannot yet regard it as altogether proven—that there will be in the majority of such cases a deposit of calcific matter and a corresponding retraction of the pulp.

Now, to revert to the pulp itself, an exceedingly vascular, highly organized body, properly on surgical grounds, which means physiologically and pathologically speaking, susceptible of reparative processes just as certainly as other highly vascular

parts, only so that the conditions surrounding them be such as do not contravene the laws of repair.

Who shall say that a portion even of this delicate organ may not be removed and yet the remainder kindly heal and continue to perform its functions in the animal economy. The fungous growth on the pulp, that neglect so often causes to be presented to our view, is a still farther proof, if one be needed, of the possibilities of the case,—of the pathological changes that even render this growth endurable, nay, almost painless under ordinary circumstances. Having thus hinted at possibilities in one direction, it may not be amiss to consider the subject of salivary calculus for a moment:—

Here a foreign substance, the product of the saliva, is allowed to accumulate and to harden until it becomes either a thick scale with its edge infringing upon the free margin of the gums, or, what is still worse, it is deposited in hard granular nodules, which cause speedily superficial ulceration of the gum margins, impinging upon and often destroying for quite a distance the attachments of the teeth, and the only marked symptoms are a little turgidity and tendency to bleeding of the gums.

In this variety of tartar, the most insidious and the most difficult of treatment of all, each separate nodule, is as much a foreign substance in the gum as a splinter of wood or a bullet would be, and is a distinct source of irritation, if not of ulceration. Hence, before a cure can be expected, it becomes necessary to remove every one of these minute points, and to polish as completely as possible by tapes or powder and sticks or silks, the entire portion of the tooth that has been subject to this deposition. Now, having removed every particle that can serve as an irritant or a nucleus for a farther deposition, the application of escharotic in not sufficient strength to act specifically, but to exert their combined coagulable and stimulant properties, is indicated. One authority says, syringe with zinc chlo., from 60 to 100 gr. to the oz., saturated solution of iodine in alcohol full strength following this; the parts to be protected meantime from the destruction of the reparative plasm that will be thrown out.

When finally well, the gums and teeth to be well-brushed

thenceforward, with brushes whose stiffness is only limited by the ability of the soft parts to endure them without being torn.

We will pass over cancrum oris, only pausing to allude to the greater frequency with which such cases come before the Dentist, and the consequent necessity for his preparation to meet them, and touch upon the subject of Epulis.

The very name of this disease is so vague that a pause is necessary to say that that variety is meant that has its origin in or beneath the periosteum of the alveolus. It partakes strongly of the nature of most malignant growths, in that a fancied extirpation extending only to the apparent limits of the disease in the soft parts is seldom or never effectual, and repeated operations are often required to accomplish what one thorough one should have done, that is to remove bone, periosteum and all, quite beyond the seeming limits of affection. Many of the more prominent Surgeons give it as their opinion that thorough extirpation, including the subjacent cancellated structure of the alveolus, is the only mode of operating which promises good permanent results, inasmuch as the disease frequently arises in that cancellated structure itself. This extirpation to be followed by a deep and thorough cauterization with argenti nitras.

It is to be hoped that far more consideration will be given to this subject by our profession, as these few words illy represent its value.

At the conclusion of the reading of this report the President announced that the discussion on this subject would now be in order.

Dr. J. Smith Dodge, Jr., said :

I would like to call attention to a subject mentioned in the last report. It is my opinion that the nature of the deposits called black tartar is not properly understood, and I do not pretend to say that I clearly understand it myself, but I would like to find out through the Association the meaning of the facts that seem to be connected with these deposits. They are not properly called tartar, for they are not of the nature of those salivary deposits

which accumulate on the teeth. Every one knows that these depositions are principally of a mineral nature, and have their origin in the saliva. There is no particular limit to the deposition of these masses, and they collect, as we have all seen, on the crowns of the teeth. A specimen of this kind cementing two teeth together was exhibited at the New York College last winter. The deposits of so-called black tartar, on the contrary, are found only on the roots of the teeth. If any dentist will recall his experience in the matter he will find that these little hard, dark-colored grains are deposited under the soft part. Their tendency is to extend towards the apex of the roots of the teeth, and I have seen specimens where a large root was entirely covered with these spots, and this must have been observed at times by every Dentist when he had occasion to extract the remainder of a fang. He has sometimes found on the apex of the fang that he has taken out a little globular shaped mass, which consists of a secretion of this black earthy matter. Any large accumulation of this deposit is never found, as far as my observation and reading go.

It was the observance of these facts that suggested to me that there must be some other source for this substance than the deposition of the earthy matter of the saliva, and I determined to investigate the nature of the deposit with the microscope. Taking the largest piece of the substance I could find, I tried several times to make sections so thin that they should be translucent, and show the structure when placed under the instrument. The substance is hard enough, if one can only get a mass large enough. It is very difficult to grind a piece so thin as to get light through without crumbling it all away. However, I succeeded in getting a section so thin that the microscope could give some information as to what was inside the thing. I found, upon examination, that the whole mass was composed, not of any definite organic structure, but that it was composed very regularly of a concentric accumulation of minute particles, having a very dark amber color under the microscope. It seemed as if a particle had been deposited, and then around it had been deposited other particles, making little spheres, and then these spheres had crowded themselves together and made up a mass, so that after all, there was

a regularity and consistency in the deposit, though nothing similar to any recognized organic forms.

It appears to me that these are depositions of the calcareous matter, which in the normal condition is secreted by the periosteum to build up the bony structure, but which, when thrown out in a slightly diseased condition of the periosteum, is aggregated in these granular masses, the vital force not being sufficient to complete the formation of bone; and I think that if the gentlemen present will examine their recollections as to how this substance is found, and bear in mind these suggestions in their future observations, they will find such a connection between the inflammatory condition of the periosteum and the depositions of this substance, as to separate it entirely from what we call tartar.

Dr. Atkinson wished to ask a question. Has any gentleman ever seen a black accumulation upon a tooth whose socket was entire, and pulp living, anywhere near the end of the root? (I suppose every one here desires to know the truth, and there is one thing certain about it; if we do not open our mouths and let the darkness out, it is very doubtful whether there is any place for truth to get in.) As I understand the law of the action of tissues this deposit is an impossibility, except on the hypothesis already suggested by our worthy member. Now, there is a means by which the elementary constituents of these globules are brought together, and it seems to me that it is at least an intelligent inquiry, whether it is not the lime salts that are brought there for the nutrition of the part, and it is a question among the best pathologists and the most earnest searchers in that direction whether the lime salts once deposited in the teeth, can ever be re-deposited. One side of the question says that they can be.

I have never seen these nodules except when connected with the external portion; where the deposition had taken place and gradually made its advancement from the opening outside, towards the end of the root. I never have seen, I repeat it, the condition of the roots referred to only when the pulp was dead and had not been removed. Hence, what is the legitimate deduction? It has become, to all intents and purposes, a foreign body. Remove it, and all you must necessarily take with it, completely from the

mouth—make it perfectly clean; wash it with a few drops of tinct. of callendula in pure water, until you are certain that it is clean, and then inject a solution of chloride of zinc, according to circumstances, from 80 to 480 grains to an ounce of pure water, and I have used as high as a thousand, with very good results, but when we use this remedy, we should use it intelligently. (Many teeth decay, are loosened in their sockets, and are lost, just for the want of proper cleaning.) Follow up the channel until you are sure that you have removed all foreign material, (and do not be satisfied with removing all foreign material, but remove the tracks of the enemy that has been there and invaded the territory,) and make it a plastic operation.

Dr. C. R. Butler, of Cleveland, Ohio, asked whether this should be done inside or outside the root.

Dr. Atkinson said:

Outside, of course. But if the root is too badly diseased, then file or rasp off the end of the root, and remove all of that portion that is so nearly dead, as to be incapable of encystment.

Dr. Butler said he had never seen a case where this disposition has been taken out of the periosteum. It is in contact with the root; that is, at the apex, where their concretion has originated, and I think if there is a careful observation made, you will find all these cases denuded of the membrane, and that the concretion is on that part that is denuded, and I have found it right at the apex, as it were, over, or a little one side. These are cases where amputation is admissible, and I find it the most legitimate way of getting rid of it.

In our mode of treating these cases we are afraid to disturb the root, but I do not think we need have any fear. We have only to be careful and make a good thorough cleansing of the parts, and we need have no fear of bad results. It is only cases where the parts are very much broken up that result unfavorably to the patient, and we can only assist nature in restoring these cases. If there is any basis to work upon, we can expect good results to follow. In all surgical operations there should be a degree of thoroughness if we wish to succeed, and the first operation should be all that is necessary, and to get rid of these points, they may

be cleared off in whatever manner may be most convenient when the case presents.

Dr. E. A. Bogue, of New York, said there was one aspect in which this thing may be viewed, which has not yet come before us. He had met a number of cases, some of them coming directly from the hands of his fellow practitioners—one case within a week, and two more within a month—and these gentlemen had pronounced those teeth free from tartar. He did not believe that in either of these cases the gentlemen who attempted to remove the tartar supposed that they had left any of it there, but he did know that those teeth would be lost if left as they were. He found, in two cases particularly, this globular deposit. The margin of the gum had the usual appearance, the only possible indication that anything existed under those gums being a slight redness, and when he asked the question, the patient replied that blood usually followed brushing. He concluded that that indication was sufficient to warrant a more thorough examination, and he found that the instrument would pass up parallel with and beneath the gums.

Continuing Dr. Bogue said:

"I have never amputated the end of the root,—in fact, have never had occasion to do so. The probability is, that I am not able to treat such cases as that, but I have taken off these globular formations, I should say three-fourths of the way up the root, after three or four sittings of my patient. If I was unable to do it the first time or the second, in consequence of its bleeding, I let them come repeatedly till they are all off.

I desire to discuss these questions, not only theoretically, but practically, so that we may know what to do should a severe case present itself to our notice.

Dr. Palmer said he would like to ask the gentleman from New York whether he intended to have us understand that he finds the deposits of tartar where the parts are intact?

Dr. Atkinson.—I have seen, after the teeth have been removed, this sort of deposit on the end of the root, that undoubtedly was there, and if I had had a sufficient amount of perception, I could have detected it before extraction. The fact of its being there, I

do not doubt. The fact of my not being able to advise that it was there, is because I have not been able to attain that amount of perception. I have seen teeth extracted when the gum was intact at the necks, with a similar exhibition, and a broken, dissolved appearance about the end of the root, where the pulp was dead.

Dr. Palmer said he had never found a deposition of that kind on the root, except where there had been an external opening, so that it could have been produced there from the outside.

Dr. Morgan said he was not prepared to say that this deposit was tartar. He had come to the conclusion several years ago that these formations did not contain lime salts. He had no microscope, but with the strongest globes he could procure, they looked like a crystalline mass of perhaps silex. In a case alluded to there was no external opening, though which the tartar could have been deposited. There had been a large tumor,—as large as a hen's egg, perhaps,—for two or three years. The case had been in the hands of several surgeons, who proposed to operate from the external surface. The removal of the tooth cured the tumor. He was very much inclined to the opinion that it is a deposit of silicious nature, taking on this form.

Dr. H. Judd, of St. Louis, Mo., said:

It seems to be conceded that this either arises from the tissues, in consequence of inflammatory action, or that it is deposited from the saliva, or perhaps from a combination of these causes.

If it is a deposition from the saliva, it necessitates the hypothesis that there is an external opening to the apex, upon which we find this deposit. Recalling all of the instances that I have seen myself, I think that I have met with no instance but what there was an external opening to the fang, and through which the deposition might have been made.

There was one thing that struck me while the gentleman was speaking who first opened this discussion. and that was this. The result of his observation shows that it is formed by accretions, and this is made up of globular masses. Now it has been asserted by good physiologists that the carbonate of lime when mingled with albuminous substances in solution concretes in the form of glob-

ules instead of crystal. Now this, to my mind, lends force to the supposition that it is an accretion formed by a deposition of carbonates and phosphates of lime, mingled in solution with albuminoid substances, which, in the form of plasma or the so called coagulable lymph is a product of inflammatory action of the gums and periostial structures, and that its globular form accords with the law discovered by Mr. Rainey, and which I have already stated. It will probably not be disputed but that in a large majority of cases where we meet with this deposit there is direct communication between it and the fluids of the mouth, and in those few cases where the gum around the neck and even the deposit seems to be intact, it is highly probable that at the time the deposit was formed, there was an opening from a fistulous abscess or other cause, which subsequently became closed.

Dr. Bogue thought the subject was not clearly understood. In the one case we find a deposition there, which we call tartar. In the other case, we find a deposition arising from a totally different cause, and which never takes place while the pulp is alive and well. Either by an external opening or not, in the former we find these globules invariably connected by a passage with the mouth. In the other case, the dental membrane may be intact, but the pulp has been extracted, or has been destroyed in some way, and in this we have a deposition of an entirely different character.

Dr. Allport said:

That portion especially of the paper just read, calling attention to the color and density of the deposit sometimes found about the necks and upon the roots of teeth; and the importance of its thorough removal, should not be passed lightly over.

A careful observer, whose practice has extended over several years, cannot have failed to notice the insidious and destructive workings that accompany this deposit, and I am pleased to notice that Dr. Bogue has brought the subject so prominently before the Association, urging as he does, a careful and thorough removal of the substance.

The idea advanced by Dr. Dodge that these dark, nodular masses, sometimes found upon the roots of the teeth are not tartar

(in the common acceptation of the term,) but unappropriated calcareous matter, deposited there through the action of the periosteum, for the purpose of building up the destroyed alveoli, is new to me, and worthy of consideration.

It is a well known fact that the calcareous portion of tartar is carried into the mouth in the saliva; and if this deposit is true tartar, this portion of it must therefore be deposited about the teeth by the saliva.

In looking back to cases that have come under my observation, I cannot call to mind a single instance where I have found this black deposit upon the apex of a tooth, and the periosteum not entirely disconnected or destroyed through a portion of the entire length of the root. I have, however, seen a somewhat light deposit about the apex of a tooth, when there had been a long standing abscess, when the periosteum and alveolus were intact, farther towards the crown of the tooth, and it can hardly be reasonable to presume that this was carried there by the saliva.

Should it however be eventually demonstrated that these deposits are not from the saliva, it may still be a question whether they are from the periosteum as suggested by Prof. Dodge. For many of the most eminent physiologists maintain that the periosteum is not a bone-producing organ, but that bone is produced only by bone.

Dr. Wetherbee said he desired simply to report a case that came under his notice some seven years since, for the consideration of the Association. A gentleman came to me with inflammation of the gums on the right side of the inferior maxilla. On diagnosing the case, I found an enlargement with a very small opening through the gum over an undeveloped wisdom tooth. The opening was exceedingly small, but large enough to pass through the point of my lancet. I passed an instrument through this opening, which immediately came in contact with a substance exceedingly rough to the touch; so much so, that I concluded that it must be a decayed wisdom tooth; yet the sensation was not of that peculiar character which arises from decay. I advised him to submit to an immediate operation, that the character of the case might be fully understood. He objected to an operation,

saying he would take the chances at some future time. I saw this case several times during the lapse of three years, at which time so great was the discharge of pus from the parts, that he became quite alarmed with reference to future results. He consulted me again, expressing his alarm, and requesting me to perform such operation as I thought the nature of the case required. I at once took my lancet and opened the gum freely, admitting a free examination of the part affected. On further examination I found what purported to be a wisdom tooth, which was at once removed, and found to be covered with tartar of the *nodulated type.* I found the deposit very thick upon the crown, less in thickness upon either side and extending down two-thirds the length of the root of the tooth. I believe that the substance deposited was carbonate of lime in combination with other earthy materials such as are usually found in the saliva.

With reference to this *greenish hue* which is said to exist, it may be the result of the presence of sulphate of lime. I cannot agree with the expressed opinions of several gentlemen, that this deposition derives its character from the immediate surroundings of the root of the tooth, but from the saliva through an opening by which it has access to the place of deposit.

Dr. McQuillen agreed with the opinion that tartar could not be deposited without an external opening. Referring to the intimation of a doubt whether the hard tissues could undergo change, he said that there was no tissue in the animal or vegetable kingdom, with the possible exception of the enamel, which does not undergo continual change. Have not the investigations and experiments of Hunter, Duhamel, and others proved this most conclusively? What are our senses worth, if we do not use them to observe the phenomena everywhere presented. Time could be more profitably spent in observing, recording, and generalizing facts than in getting up fanciful theories, expressed in language incomprehensible to ordinary minds. Dr. Lionel S. Beale was the first to take exception to the general view relative to changes in hard tissues, and the speaker combated his statement several years ago. He cited, in proof of constant change, the formation of the frontal, sphenoidal, and maxillary sinuses, the diploe in the

flat bones, and medullary canals in the long bones, and the process by which the deciduous teeth, after being built up cell by cell, at the proper time, by a retrograde metamorphosis, are absorbed cell by cell. In the permanent teeth the evidences of change were constantly occurring—as in hypertrophy of the cementum, and the not infrequent absorption of the cementum and dentine in other cases. Permanent teeth extremely soft in early life become almost as hard as flint at a more advanced age. Again, teeth which had been quite dense and perfect in their structure, as in the case of females, after the commencement of the maternal functions lose much of their former hardness, owing to the waste constantly going on not being supplied by a sufficient amount of material to meet the demands of mother and child; in which case the latter is nourished at the expense of the former, and the mother's bones and teeth become softened. He drew attention to these facts mainly to induce greater efforts for the preservation of the teeth of young persons, as operations, the success of which might almost be despaired of, would frequently prove of lasting benefit, owing to an improvement in the texture of the dental organs.

Dr. A. B. Robbins, of Meadville, Pa., said:

In addition to what the gentleman has said of physiological conditions, there are pathological conditions, which together form part of the nature of our discussion at this time. We find patients who have not this physiological condition. Teeth that have been of good character are softened so as to present the appearance and condition that has been spoken of. We also find that by the administration of lime salts, this condition is removed, and in a very few weeks, in many cases, teeth can be so completely restored and hardened, as to warrant the belief that they may be saved. I have been familiar with several such cases within a very short time, and for several years have had such cases under treatment.

Many teeth have been sacrificed by those who have not noticed this thing, and teeth that have been soft when they came under the hands of a practitioner who did not understand this, have been in many cases destroyed, when by careful treatment they would have been, in a very short time, restored to health.

There is a subject coming under this head of pathology, which I would like some light upon. I have called attention to the same thing repeatedly, year after year, but as I am yet in darkness, to a great extent, I still desire light, and as long as I feel that desire, I am anxious to obtain it. It is the destruction of the teeth by disease in and about the sockets. We find now increasing in many localities, this disease, which frequently begins with displacement of well-formed, fully developed and apparently healthy teeth. The displacement seems to be caused by the absorption of the thinner portion of the alveolar process, and the consequent thickening of other parts, where nature, trying to counteract the disease, often forms large nodules. Following the displacement we see looseness of the teeth, with separation of the free margin of the gums from around the necks, recession and suppuration. The seat of the disease moves about—the suppuration appearing now on one side of the mouth, and now on the other, then, perhaps, returning to its original position. The local trouble is finally ended by the loss of the teeth. This abnormal condition is not alone caused by calcareous deposits. These will aggravate it and hinder the return to health, but more than local treatment is needed.

Dr. John Allen said:

There is a physiological fact connected with this subject, that I think should be carefully investigated by every member of this Association. It is the fact (to which our friend has referred,) in reference to the changes in dentition. We know that there are various theories, but facts are more reliable. Let us look at this for a moment, giving a practical view of the subject. We take into the system nourishment to build it up. The various nutritious substances in the food that we take, are intended by our good Father to build up all parts of the system,—the hard tissues as well as the soft tissues. He has provided that of the food intended to build up these organisms, certain portions make bone and teeth. Now, the particles of matter are deposited atom by atom, and the system is gradually built up. He knew just what proportions to put there for our use, to build up these bodies. He used certain proportions for the hard as well as the soft tis-

sues. Now, when we take the food into the system, it is converted into blood. This blood is conveyed through all parts of the system in little corpuscles, which are freighted with the proper constituents to sustain and build up these organisms. These little corpuscles convey the various constituents necessary to the production of bone, teeth, flesh and the fat, and these various substances are deposited just where they should be. Now, it is essentially necessary that we have these little vesicles freighted with the proper constituents, and duly freighted. How shall we know this? By taking the food just in the proportion that our Father has provided it for us, and as it comes from nature's laboratory.

Now we take this ground from the fact that as a nation we have worse teeth than any other on the earth. Now why is this? Simply because we change the proportions of these various constituents that our good Father has provided for us, by separating away what He has put there for the building up of the hard tissues.

To prove this, let us look to other nations. They that do not change the proportions of the various constituents that enter into their bodies, do not have decayed teeth, or as a general thing, no more than they have decayed fingers or toes. These are facts, gentlemen, if you will only take the trouble of investigation, as I myself have done.

There is a constant change going on, and particles of matter are deposited atom by atom, and the system kept fully charged with the mineral elements of which these structures are built up. When you look at nations that do not change the proportions, you see no decayed teeth, and the history of these nations proves that their teeth are sound and beautiful to old age.

Now I have referred to this subject before. Nevertheless, I do not believe that it has sufficient root in the mind of every man. Now we will turn from other nations—who do not change the proportions of their food, and who do not have decayed teeth—right back to our own. What is the condition of our country? We *do* change these proportions. We *do* ignore the mineral elements that this good Father has provided for us, and we do have

decayed teeth. We find that there are over twenty millions of teeth swept from our population every year.

We do not take the material into our system that carries back, atom by atom, and keeps the hard tissues built up until the old particles pass away. The old particles pass away after they have served their purpose, and new ones then take their places.

It is estimated that every child uses a half a barrel of flour every year, and it is estimated that there is forty pounds of this thrown out from every barrel that we use. The child takes its food on fine flour, and is deprived of twenty pounds in a year of this mineral element which should be taken into the system in order to make those hard, flinty substances that our Father intended. Now, by the time that child is twenty years of age, it has been deprived of four hundred pounds of the elements which should have been taken into the system, and would have kept it charged sufficiently to have kept these substances hard and flinty, as they should be.

We sweep from our American population over twenty millions of teeth every year, and this should prove the theory that our tissues do undergo a change, and that particle by particle they pass away.

When you have come to that conclusion, and will exert that influence in the community that we should, as a profession, I think that we can do much to prevent the destruction of teeth. As it is now, they are getting worse and worse every year, and not only this, but it becomes hereditary, and is transmitted from parent to child.

Now, we employ twenty-eight thousand men to change these proportions of food, and some ten thousand dentists, perhaps, to counteract the ill effects they have produced, but we do not half do it, as we see worse teeth now than when we began. Ten thousand men cannot repair all the injuries that these twenty-eight thousand men produce.

Dr. Allport mentioned that the Association had been invited to meet in Canada.

On motion of Dr. Ambler, a vote of thanks was extended to the gentlemen visiting us from Canada, for their courteous invitation, although acceptance this year would be impossible.

The chairman of committee on arrearage of dues, reported as follows:

The committee to whom was referred the resolution in regard to arrears of members, and the proper course to pursue in distributing the transactions of 1865 and 1866, would respectfully report that they have given the subject due consideration, and recommend

1. That the names of members who do not consider themselves as belonging to this Association be stricken from the roll.

2. That the names of those, who do not pay their arrears to the present time, for the years of 1865, 1866, 1867, on or before the next meeting, 1869, shall be dropped from membership in this Association.

3. All persons, being members in 1865 and 1866, and having paid no dues, or having paid for only one of these years, are not entitled to the transactions of those years, until said dues are paid; and those who became members in 1866, and paid their dues in full for that year, may have said transactions by paying one dollar extra for 1865—about the amount of cost of publication.

Resolved: That no member of this Association hereafter is eligible to hold any office, or entitled to vote, or take part in the transactions or business of this Association, unless his dues are paid in full.

Resolved: That the Treasurer report to the Chairman of the publishing committee, the names of all who have paid their dues, and to only such shall the transactions be sent.

Respectfully submitted.

W. H. Morgan,
I. J. Wetherbee,
John Allen,
W. W. Allport,
W. H. Goddard,
} Committee.

On motion, the report was accepted, and after a free discussion, adopted.

On motion of Dr. Horne, the following addition to the report was adopted:

Provided: That no person shall be excluded from the right to reappear at any time, as a delegate from any local society, by anything included in this report.

The President announced that immediately after the convening of the afternoon session, ten minutes would be allowed for the transaction of miscellaneous business.

The members of the nominating committee were requested to meet in the ante-room immediately after adjournment.

Adjourned to meet at 3½ p. m.

THIRD DAY—AFTERNOON SESSION.

The Association was called to order at 3½ o'clock.

Minutes of the morning session read and approved.

Dr. Wetherbee, chairman of the committee to whom was referred the subject of compensating the Treasurer for past and future services, reported as follows:

Your committee are unanimous in the opinion, that the labor performed by the Treasurer during the past year is of such extent, that he should receive remuneration therefor, in the sum of fifty dollars; also, that said sum be paid annually to the Treasurer of this Association.

Your committee further recommend, that the sum of fifty dollars be paid annually to the Recording Secretary with the understanding that he shall prepare for publication the transactions of this Association, provided said transactions shall be early distributed to the members of the Association.

All of which is respectfully submitted.

I. J. Wetherbee,
B. T. Spelman,
T. L. Buckingham. } Committee.

A communication from the Secretary of the Central States Dental Association, concerning charges preferred and sustained,

before that body against Dr. B. M. Gildea, for unprofessional conduct was referred to committee on ethics.

Committee reported sustaining the action taken by the Central States Association, and the name of B. M. Gildea ordered to be dropped from the list of members of the American Dental Association.

The report of the publication committee was called for, and further time granted at the request of the chairman.

President Taft, announcing that the discussion on dental pathology and surgery would now be resumed, said that he had but a few words to say upon a subject bearing upon dental pathology, and yet not a pathological condition, viz: the changes that occur in the dentine under the influence of systemic changes.

It is a very common opinion, that when the dentine, for instance, is once formed—has received its relative amount of constituents—it is not subject or liable to any appeciable change, except perhaps a slight increase of density as age advances.

Close and systematic observations, however, bring us to a different conclusion. It is a fact easily demonstrated that systemic changes, involving deficient or arrested nutrition, induce corresponding conditions in the tissues of the teeth, and in the dentine more than in either of the others. The excessive irritability and sensitiveness of the teeth during gestation and lactation is most palpable evidence of this; and the change from the comparatively firm and dense structure, to a softened condition, almost as though decayed, is incontrovertible evidence of a change having taken place.

These changes and variations, will, with the skillful, necessarily modify treatment.

I understand Dr Atkinson to say that his opinion is not settled upon this point. Are we to understand him to refer to any change that may thus occur in the dentine, or only to the extent to which such change may proceed.

Dr. Atkinson here explained what he had previously said on the subject referred to.

Dr. Taft resumed:

The length of time required for such change, or the rapidity of

its progress, will vary very much in different cases; under favorable circumstances perceptible change will be produced in a very short time, either in the direction of deterioration or reparation.

Doubtless any close observer has witnessed instances in which the teeth have improved rapidly; becoming more and more dense and resisting in a corresponding degree the encroachments of decay.

In the ordinary operations upon the teeth, the condition I have referred to cannot be ignored with impunity. Cases often occur in which teeth are destroyed by inopportune treatment.

An exalted sensitiveness always attends the deterioration of dentine. The treatment of such teeth is a very delicate matter, and especially so the operation of filling with metal. I very frequently refuse to fill such teeth with metal until a more favorable change is established.

For the arrest of decay in such teeth, protection of the decaying part is absolutely required, and hence some substance that will perfectly exclude all foreign substances, is a non-conductor of heat, and that will remain unchanged for a few months, will serve an invaluable purpose. Nothing, as yet used is better for such fillings than os artificiel or Hill's stopping.

Exalted sensitiveness does not always accompany a softened condition of the dentine.

The effort of nature for reparation is manifested in various ways; and not more in the restoration of the entire dentine of the crown of the tooth, than by the solidification that takes place sometimes about a cavity of decay, an effort of nature to stay the destructive process, which often results in its complete arrest. In such cases strata of dentine of variable thickness encompassing the cavity will be found. These strata vary in density from that of the dentine, to that of the enamel, in some cases presenting a density that will almost resist the hardest and sharpest drill.

Thus we see that the dentine is susceptible of remarkable change, and still retains its vitality, and the power of recuperation.

Let us see to it that we aid nature in her efforts to maintain the integrity of the living organs and tissues to us so precious.

Dr. Atkinson said:

If our mental faculties are up to the point in this case, we will not pass with the pathology that has been expounded by the chair. What is irritation? [Here a buzzing ran through the house causing an interruption. Dr. Atkinson continued.] We had better pay more attention to what is going on here, and less to what is going on outside, so that when we come together we can come to something like a comprehensible understanding of the subject, so that when we go home and have a fellow creature come to us to be redeemed from the powers of disorganization, we shall not be timid, but shall be imbued with energy and spirit to do them good, and thus remove the obstructions out of the way.

Now, what is the whole philosophy of filling teeth? It is based on the unchangeableness of the condition, or else you have no permanent filling. We interpret a man's faith by his actions. A man's faith is displayed in his practice. I believe in putting things into the teeth that irritate them. I want to stir them up to normal action, and if I had a tooth that was in the condition spoken of here, and it would be possible to corrode the dead surface of the tooth, I should do it.

We want first to convert all that dark substance into something as near a healthy condition as possible, and this is then covered over, (encysted,) so as to be able to resist any further change. This much as answer to what has been said. If things do not irritate they cannot be relished in the food, or useful in the medicine, or active in the poison that constitutes the basis of therapeutics and the happiness of result with which the operation is crowned. I have used this term irritancy to signify that very thing. Everything that we do in the way of surgery has reference to that very irritancy, and to the similarity or dissimilarity that constitute a poison, food or medicine. In the first place I should say food, because that is a normal action, as we must be fed to live; second, you must be poisoned to be sick; and third, you must be doctored in order to get well. This whole law of irritation of tissues is so plain to my mind that I would be willing to go up this moment could I communicate the same perception

to every one of you in this room, not to say to every one of our profession throughout the length and breadth of this land, and throughout the world, and I hope that some day we may come together and be ready to prove ourselves what we claim to be, a scientific body.

You know very well that the difficulty is when the pulp is exposed or nearly so. Now, if we can arrest this action and preserve that pulp, every man in this room will say that the tooth is in a healthy condition. It has been announced that that can be done. It can be done—it has been done, and I assert it boldly. He is to be held responsible who wilfully destroys the pulp. All we have to do is to simply use any of the substances capable of producing an insoluble coagulum of the main tissues of the pulp, and use it intelligently and properly, causing healing of the exposed part in the pulp, when the filling of the teeth is but a very small work. So you see that this very idea is where I spoke about a man's faith sticking out in his practice. His faith is that if he puts any substance in the cavity of decay sufficient to exclude moisture, air, and all irritating substances, that the tooth is saved. That is his faith. If that is not his faith, he is not honest. His money that he gets from filling teeth is not his own.

Now, this subject of pathology is one that we are all interested in, and have here assembled to understand. Therefore, if we would be prepared for every question that can possibly come before us, instead of passing it to some other more literary outside practitioner, get your pathology right, and your physiology right, and then only are you ready to begin with your practical matters. To all reading men I need not say another word.

Do you want to know how to produce this action on the pulp? I will tell you:

When you desire the pulp to heal, all you need to do in that case is simply to put creosote on it, until you shall have caused a coagulum of the structure on the surface; then wash it clean with tincture of callendula and water; then dry it out with bibulous paper, and have some oxychloride of zinc prepared. Take creosote on a little cotton, and wet the entire surface of the cavity.

Then take some soft, plastic oxychloride of zinc and lay it carefully on the exposed point and tap it a little, and by the capillary attraction it will adhere; then fill the tooth completely. I would not fill it up at first, but wait a few moments for it to harden, and then fill permanently, and you are sure of the one filling lasting for an indefinite time.

Even though the inflammation had gone to the point of throwing out pus, the same treatment would be perfectly successful, but in case some one might undertake to do it as he understands it, and not as I say it, I would not advise that, but I would clean it out and treat it in exactly the same way, as a simple exposure, requesting the patient to let me see the tooth at intervals, and then have it filled permanently in a few days, weeks, or months, as the case might be.

I am here to-day to show you the way,—not to have you go through the same practice that I have been to come into the information. Now that is the rule by which I should be governed in all cases. That is precisely what I should do where there were expositions around the roots, as were complained of to-day. Remove all elements that do not belong there, and then dress with hydro-chloride of zinc.

Dr. B. T. Spelman, of Warren, Ohio, said he would like to know if the application of this acid, or preparation of zinc will not produce pain?

Dr. Atkinson:—I have never occasioned pain except in one case, but if you put it in without the creosote, it will in almost every case produce pain.

Dr. Spelman asked if this acid was not a solvent of carbolate of albumen?

Dr. Wetherbee wished to know if suppuration ever took place unless the circulation was entirely destroyed?

Dr. Atkinson said:

Suppuration does not take place where the circulation *is* entirely destroyed. Now, suppuration means the production of pus. Pus is made up of elements like every other body, and it is characterized by the specific quality of these elements, enabling us to denominate it pus.

Dr. Wetherbee:—Did I understand you to say that after pus had escaped from the pulp, it could be saved and remain a living part?

Dr. Atkinson:—Most absolutely, yes; and I can prove it, as I have abundance of just such cases in New York.

Dr. Wetherbee:—I would then ask the question, if it be a fact that pus can escape from the pulp until circulation is destroyed?

Dr. Atkinson said:

I have already answered that question, and said that when the circulation is entirely destroyed, no suppuration takes place. The first thing that it does is to produce a dissimilarity of irritancy. What does that do? That arrests the circulation in the part to a degree that is denominated stasis. What is the result? pus. Debility acts first on the periphery on the capillaries, enlarging the calibre of the canal that is in this capillary vessel which circulates the blood, and in which it circulates most freely; and the reason it circulates most freely there is simply increase of normal irritancy, by narrowing the channel; and pus is produced along the enlarged portions by the transit and death of the blood corpuscles. To my mind, that answers the question completely.

The difference between past pathology, and the coming knowledge of physiology and pathology, is this: The old does not recognize, by any recorded witness, that every tissue in the human body is made up of white and red blood corpuscles, and when they fail to put these manufactures of the economy into the different structures of the body, irregular action takes place, and we get what are first abnormal tissue, and then the formation of new structures in the body, or a dissimilarity of irritancy in these local channels, in which the action first takes place, and we get tubercle, pus and cancer, and a mass of malignant poisons, all arising out of disintegrated blood corpuscles. I announced this fact in 1859, and was called crazy for it in the presence of our presiding officer.

Dr. Spelman said:

This question, as regards the production of pus, I do not believe is clearly settled at this day. I understand that Dr. Atkinson

holds that it exists in the blood, that the blood corpuscles are the pus corpuscles, but the generally accepted opinion and belief is contrary to that. I am glad to learn in this connection, that he has been so successful in treating pulps in this way, for I have seen and consulted parties as to their success in this direction, and have universally received from them the fact that they had not. If this is so, the result must necessarily be dangerous, and I should want to see a patient every day after I had filled a tooth, as we don't know how far that congestion may go.

In the treatment of the nerve, why is pain produced? What is the cause? The nerve itself is so soft that it will escape the disorganizing effect produced by the corrosive power of the acid. How long will that pressure last. Is there not danger that when you get a determination of blood to the point by reason of this,—how do you know that that determination of blood will not go on until we get congestion? Now sir, God in his wisdom never ordered that we should place there the very material that will supply the destruction that may follow that decay upon the tissue, and I claim that every time you get up an irritation there, that pain will cause more blood to flow there, and which may result in the permanent destruction of the pulp.

Dr. McQuillen said pus was regarded, by the best authority in surgery, as a fluid, composed of dead exudation corpuscles floating in serum, these exudation cells, in their normal condition, being the tissue builders. It was impossible that white corpuscles could pass through the walls of vessels to be incorporated in the structure of nerve tissues. He had been accustomed for years to demonstrate to his students the circulation of the blood in the frog's foot, tongue, lungs, and in the mesentery, and had watched the process by hours, and had yet to see the phenomenon referred to. Admitting Conheim's observations to be correct (which he was not disposed to do), the propriety of drawing deductions from pathology to sustain physiological theories was a very defective and illogical method of reasoning. The number of persons who had seen ultimate nerve fibres was exceedingly limited. Only those who had employed the higher magnifying powers could lay claim to this distinction. The corpuscles rolling through the

capillaries might appear to pass through the sides of the vessels, but it was only an ocular deception. The calibre of an ultimate nerve fibre was infinitesimally smaller than that of a white corpuscle, and, in addition, it was made up of three distinct structures, the neurilemma, the white substance of Schwann, and the axis cylinder. How, then, can a corpuscle make up such a nerve fibre? The same objections held good with respect to muscles being formed from the red corpuscles. The ultimate muscular fibrillæ (which consists of the myolemma, a membranous sheath inclosing the sarcous elements) is much more minute than the red particles of the blood. Many years ago similar views to those presented here were advanced by Doellenger and Dutrochet, and their fallacy was then exposed. The perfection at which microscopy has arrived, and the use of good instruments, enable us, by comparing with precision the size of different parts, to completely refute this untenable theory.

Dr. Wetherbee:—I believe that it is perfectly practicable to apply oxychloride to an exposed pulp, even when decay has advanced so far that in excavating the cavity the pulp is made to bleed freely.

I will give you a statement of a case in point which I reported to the Association at Cincinnati last year, in which the decay was very deep, the pulp being largely exposed.

It was impossible to prepare the cavity without bleeding the pulp quite freely. Nevertheless, having succeeded, as I believed, in two previous cases, in saving the pulps when free bleeding had transpired, I believed that I might be equally successful in this case. Having prepared the cavity, I introduced creosote until bleeding had subsided. Then followed the application of oxychloride to the pulp and surroundings. At first it gave acute pain. After sufficient hardening I excavated a portion of the oxy-chloride in order to have retaining points for the filling. Before I had finished the filling, all pain had subsided.

Having seen this patient frequently since the operation was performed, I am assured by him that there has been no recurrence of pain.

I believe that the transient pain that is caused by the appli-

cation of oxy-chloride of zinc, is in no sense a dangerous foe, or that it in any way compromises the future health of the tooth. The slightly caustic effect of chloric acid is an advantage to the pulp, because of its astringent properties, thereby relieving it from pressure by capping, thereby making success doubly sure. The philosophy of its action may be expressed in a few words. The exudation of *liquor sanguinous* from the pulp and tubules makes a healthy surrounding for the pulp, because its porosity so nearly corresponds to the tubules of the dentine.

Up to the present time, I have not, to my knowledge, lost a single tooth, and yet it is possible that some of those pulps are dead. I am sure, however, that not one has had its demise recorded. To my certain knowledge, two cases which were treated over two years since, where both the pulps bled freely, were alive two months ago.

I would therefore most heartily express to you my faith in this practice, as one eminently conserving the highest and best interests of those committed to our charge, and he who has not as yet been able to comprehend the progressive tendencies of our profession, should early take lessons of his next door neighbor, that he may be dentologically developed to that degree which is requisite for a safe and successful practice.

Dr. Dodge said:

This capping exposed nerves is no new thing. You all know very well that capping nerves used to be a favorite fancy a good many years ago, before I was a member of this profession, and since I have been a member of it the fashion has been decidedly on the decline. I remember it used to be a favorite practice with old Dr. Harris, in his latter days, when I attended college. I remember there was a long list of materials proposed for covering, and I remember that with all the rose-colored hopes with which young gentlemen undertook these things, the men who had applied them over and over again were beginning to adopt other methods, for the result was that after a period of six months or a year you would find a dead pulp there; you would find a tooth out of which the filling would have to be removed, and another long operation gone through with.

As regards this new material, a little piece of my own experience occurs to me. I suppose the efficient agent, in oxy-chloride of zinc, so far as it produces any irritation is the chloride of zinc with which we have all been familiar for a long time, and which is preferable as a dental caustic to nitrate of silver, I suppose only because it does not discolor. Every one knows that this will cause insensibility of the surface of dentine, lasting for some time, long enough to fill the teeth. Some eleven years ago when I was just beginning to practice, there came into my hands two teeth, which I must fill as best I could. They were so far decayed that a dentist in respectable standing said he could do nothing with them. I scraped them out, found a tender spot, and put a lump of chloride of zinc into each of them, and the lady lay down on the sofa in agonies for a little while, and when she got over it, I filled them at one sitting, and those fillings stayed there in good condition for five years. At the end of five years I removed the fillings, and both the pulps were dead, and had been so for a long time. No pulps, or any signs of pulps were there, but there had been no pain or uneasiness of any kind from the time the fillings were put in, and I conclude from this that chloride of zinc is a capital application in certain cases, for destroying the pulps of teeth.

I have myself occasionally taken out a filling of oxy-chloride of zinc, and found the pulp dead, but whether in each of these cases the pulp had been dead beforehand, or whether the preparation had killed it, I cannot say.

I would like, sir, to go back to the original remarks of the Chair, and add a little corroborating testimony. As I understood the statement of the Chair, it was that he believed that there takes place a sort of conservative process in dentine, in the neighborhood of decay, by which additional earthy matter is deposited in its structure, and it is made more dense, and less liable to decay, and in some instances the decay is entirely arrested, and the cavity may remain without any further change taking place.

I once made some experiments with a view of determining whether there was an actual deposite of earthy matter. I provided myself with a considerable number of teeth in which there

had been decay—teeth which had been extracted for one reason and another. Taking a number of these teeth and removing thoroughly the dentine, which had become softened by decay, I cut away a little slip, consisting of the portion that would lie between the bottom of the decayed cavity and the cavity of the pulp. I then cut a piece, similar in size and weight, from another part of the tooth, opposite the side of the crown, which had been entirely removed from the cause of decay. The next step was to take carefully the specific gravity of each of these pieces and compare them, and the next step to calcine each of them. I have the tables at home, giving the figures resulting from these investigations, but can only remember the general results.

There was only one case out of something like a dozen which I carefully investigated in this way, in which there was not an increase of specific gravity, showing that some kind of matter had been deposited to a large extent, to increase the percentage of earthy matter, the excess varying from one to three or four per cent in the whole specimen of the tissue lying between the bottom of the decay and the pulp cavity.

I carried the experiments further: I drilled out the part that was softened by decay and cut a little ring consisting of tissue lying around the cavity of decay, and equally distant from the pulp cavity, and then taking a specimen from another part of the same tooth, quite removed from any diseased action, I made the same comparison.

In these cases the increase of density was less constant and less marked, but in several cases there was a noticeable increase. From all these experiments I long ago satisfied myself that there is a tendency in the dentine to resist decay by deposition of earthy matter in its substance, which pretty generally increases the density of structure between the decay and the pulp, and sometimes around the sides of the decaying cavity. I may add that I have observed under the microscope the appearances particularly described by Tomes, which fully agree with these conclusions.

Dr. McQuillen said:

In regard to certain facts which have been mentioned, I do, most respectfully, take exception.

According to my conception, pus is a fluid consisting of an exudation. This exudation of corpuscles has its origin in cells. The red and white corpuscles in the minute vessels are the germs, and they nourish the nerve tissue and the muscular tissue. It is true certain assertions have been made. I have been for years a careful observer of the circulation of the blood, in the web of the frog's foot, in the tongue of the frog, and in the lungs of the frog. I cannot recognize the principle of drawing deductions from pathology, to carry out certain views, as far as physiology is concerned. I have never yet looked into the pathology of the frog, but have intended to make a careful examination in that direction. What does microscopy prove to us to-day? (and here I would say that unless these examinations are made with a good instrument I question the position). What does the microscope prove to us? It proves that the diameter of these corpuscles is about on an average 1-3000 of an inch. If you observe these as they are forced through the capillaries, you will find the white corpuscles on the outside of the stream, and the red on the inner side of the stream. Occasionally you will see a red corpuscle passing out from the side of the capillary, but it is only passing out from the channel that was closed. The diameter of the red corpuscles is about 1-3500 of an inch. The ultimate nerve fibre is infinitesimally smaller than the 1-3500 of an inch.

What is the anatomical composition of the nerve fibre? Is it composed principally of the white corpuscles? Now, how is it possible that the white corpuscles, which are larger than the red corpuscles, shall go towards the making up of the nerve fibres? You will find that it is made up of a number of fibres, this fibrous system forming what is called a sheath, and inside of that these elements. The muscular fibres are twice as small as the red corpuscles. These are facts. We should not indulge in visionary speculations. The time has gone past when we shall build up certain theories without any foundation in fact.

Dr. Allport asked if, in treating these nerves with oxy-chloride of zinc, it was done after the nerve was exposed.

Dr. Atkinson said:

Certainly I do, and in my operations I use a solution of

twenty grains to the ounce to bathe the tissue. Now, there is no one with whom I am acquainted that has claimed the positions assumed, that the blood corpuscle had to enter into an ultimate nerve fibre, as if that were a vessel. White tissue is constructed of white corpuscles; muscular tissue is constructed of and nourished by red corpuscles. The capillary walls are structureless walls. They are as amorphous in their appearance as the sheet of rubber we use. Gentlemen who attempt to criticize other men's observations ought to be familiar with the language of the particular people who are making the investigations.

What is the cause of the color of muscular tissue? I defy the world to explain it, only on the hypothesis that it is the broken up elements of the red corpuscle; and I defy the world to prove that the red corpuscle is not a white or colorless corpuscle in its original formation. The blood corpuscles are formed absolutely independent of vessels. This will, one of these days, be as tangible as mathematics. We have all the coloring elements in the chick before we have any of the outlines of its body, except the original white corpuscles that had been strung together in a rudimentary state for this very purpose.

Dr. Allport said:

Exactly what proportion of exposed pulps can be preserved alive by any method of treatment can be determined only after the comparison of a large number of recorded cases. After the explosion of Dr. Harris' theory for the treatment of this class of cases, most of the profession scout at the idea of attempting to save exposed pulps; in fact, but three or four years ago, some who now boast of almost universal success, looked with a quizzical sort of squint at those who said they had succeeded in saving exposed pulps, as much as to say, now I wonder if you expect me to believe that.

In the treatment recommended by Dr. Harris, he simply aimed to avoid pressure upon the pulp thinking that thereby he would prevent inflammatory action.

This result he sought to accomplish either by protecting the pulp with a metallic cap and filling over it, or by introducing his filling in such a manner as to leave a space between it and the

point of exposure. This treatment, which would at first thought seem to be well adapted to the exigencies of the case, has been demonstrated to be a most efficient means of destroying rather than preserving the pulp. Nor is this result to be wondered at when we inquire into its cause. In exposing a pulp it always happens that a greater or less number of the vessels upon its surface are ruptured, and inflammation more or less violent always ensues. By reason of this inflammation the pulp becomes more or less enlarged, and it being confined within solid walls the exposed portion is pushed through the opening in the dentine, and coming in contact with the sharp edges of the tooth, a constant irritation is kept up until the entire pulp is involved in active inflammation, and strangulation and death is the inevitable result.

Because success has not attended this most absurd practice most of the profession seem to think that progress in this direction is impossible, and that all attempts to save the life of this important organ, when exposed, should cease. Nevertheless, there are those who do not sympathize with this conclusion. They believe that the dentinal pulp is amenable to treatment, and from their success in certain cases, they feel justified in saying that it is not necessary to destroy all pulps after they have been exposed.

In regard to the success of the operation that I brought to the attention of the profession a few years ago, I have only to say that my experience in this regard has not been uniform. My success in some cases, however, has demonstrated that the dentinal pulp is amenable to treatment.

That I failed in some cases is not to be wondered at, whilst my successes have clearly demonstrated the correctness of the principle upon which I operated. My failures have but shown that I either did not understand the requirements of the particular case, or had not the requisite skill to perform the operation properly. That I have succeeded in some operations of this nature, I proffer you not my word only, but fortunately there are gentlemen in this room in whose presence I have removed the fillings, put in over pulps upon which I had performed this operation, and

they have seen the pulps covered with a new calcareous deposit, and the teeth not only living, but in a healthy condition. One case in particular I will mention, where the entire anterior portion of the crown of the pulp had been exposed and operated upon. There is at least one gentleman present who in this case, saw a new deposit of dentine covering the pulp.

Because I have demonstrated that success may follow this practice I have no desire to press this operation upon the profession, for I too well know the trouble and doubts attending it. But surely an organ that can withstand the treatment that I have given it, ought not to be abandoned as without hope, and it is an encouraging sign of progress that so many are experimenting with a conservative end in view.

As to the use of oxy-chloride of zinc I have only to say that I have never used it as a covering to exposed pulps; but while I can see objections to its use, I am free to say that I can see many reasons why it may be useful for the purpose mentioned. I shall try it.

If the statement made by Dr. Dodge should prove to be correct—that the dentine is more dense just in the neighborhood of decay than it is in any other portion of the tooth—does not the fact furnish us with an important hint in regard to the so-called dentinal fibrils. Tomes is of the opinion that the dental tubes are filled with dentinal fibrils, analogous to nerves. From the microscopical preparations I have in my possession, as well as from my observations and experience in treating sensitive dentine, I have no doubt that the dental tubes are filled with an organized and living structure. But just what the tissue is, is a question difficult to solve.

Several years ago it was said by Mr. Lent that the dentine was formed by a series of cells, based upon the pulp. The observations of Mr. Lent, were subsequently confirmed by Mr. Köl-liker, and in a recent edition of his work, in German, not yet published in English, he describes and figures what Tomes regards to be dentinal fibrils, to be nothing more nor less than the elongated dentinal cells through which, or by which the calcareous portion of the dentine is deposited. Should this conclusion of Mr. Köl-

liker be found correct, I think it will help to solve the question as to how it happens that new dentine is deposited upon the surface of exposed pulps. If cells can heal after a portion of them has been cut off, there is no reason that I can see, why they cannot again perform their function and deposit new matter for dentine.

Dr. Cole said:

I have used this in endeavoring to save the nerve, and if I have ever saved a single nerve I am not aware of it. I have used it in some cases where I have not yet examined the teeth, and dare not, and am confident when I do so the nerve will be dead. I have never, in one single instance, after examining it thoroughly found a living nerve, after having given it a reasonable time, and have discarded it entirely. From a conversation with some friend, who assured me positively that it was the *ne plus ultra*, and that we were sure of saving the nerves, I made this a hobby —I am sorry to say it. My patients, I expect, curse me for it. I have made it an utter failure, yet applied it as carefully as any one could do. My practice is large, gentlemen, and I don't know but I may be induced to try it again. If Dr. Wetherbee or some of the other members will show me that it is a success one-half of the time, I should be glad. If a patient comes to me with exposed nerves, I always think why did he not come to me before the nerve became exposed. But we cannot control our patients. They won't come when they ought to, and if there is any treatment that will save them, I should like to know it, and if Dr. Wetherbee will bring two patients next year to Saratoga, I will pay his fare there and back, and it will gratify me very much. If I can go home from this place, this year or next, with the assurance that exposed nerves can be saved, it will pay me for spending my time, and for what little money is spent in procuring the information.

Dr. Wetherbee:—The same teeth which are preserved by following the method prescribed, and the like process of several gentlemen here present, if filled entirely with oxychloride of zinc, will usually die because it cannot be hermetically sealed, owing to its porosity.

As doubt has been expressed by several gentlemen present of the utility and success of oxychloride capping I will announce, that if any gentlemen present has exposed pulp, or if one can be found to-morrow morning at eight o'clock I will treat that tooth, on the condition that he will present himself at Saratoga next year. If the pulp is alive, you (Dr. Cole) shall pay the bill, and if the pulp is dead I will pay the bill.

Dr. Freeman:—Did I understand you to say that you use the oxychloride in every case where you find exposed pulp?

Dr. Wetherbee:—If we are satisfied that the pulp is in a normal condition.

Dr. Freeman:—If I treat a nerve, and the nerve is healthy, I invariably wipe it over with creosote, and put in the filling, and have been very succesful, and yet it may be, that in every case where I have used this new filling, it will have an influence on the nerve which will tend to harden it, and at the same time the nerve will shrink. Now I want to know how far, and to what extent we can use it.

Dr. Atkinson:—Pay attention to what I say and you will know. I will say that I have seen this action go on so far, as to convert the pulp into a perfect mass like the white of an egg. Use your creosote first, and thus shut off the excessive action of the other. I remember distinctly that Dr. Wetherbee said something to call in question my theories in reference to oxychloride.

Dr. Freeman:—I have used it quite a number of times with creosote, and quite a number of times without. Now, if the creosote is a matter of safety, why do not those who never used creosote, adopt it?

Dr. Bogue:—Another point will be presented. I protest against the indiscriminate use of the oxychloride. Dr. Dodge, alluding to calcific deposits, alludes to an indication which should lead us to a conclusion, when we fail to know that such a result must follow. I have within a few moments learned that he has in his possession, a specimen showing the deposition of secondary dentine opposite the point of injury upon the tooth. The case in this instance was a deposit of secondary dentine, infringing upon the pulp, and the pulp had retreated. Let us examine the cause

of our failure, and we shall then be able to apply the proper remedy. I cannot say that I have taken any of the fillings out, for I have not.

Dr. Kennicott said:

There appears to me to be some misunderstanding of ideas in relation to the appliances in the treatment of pulps. In no case, does it seem to me, would any sensible man proceed to fill a tooth permanently, until he had first restored the pulp to a perfectly normal condition, if he fouud it otherwise. If he found it exposed, he may then, as a matter of course, proceed to fill it permanently, first using a mechanical appliance to exert pressure on the nerve if he found it in an abnormal condition. All appliances like oxychloride of zinc, is merely preliminary treatment—it is not filling. It is intended simply to give the nerve or pulp a chance to become restored to its normal coudition, when it is contemplated to complete the permanent filling. This is simply one step towards restoring the nerve to a normal condition, previous to the final operation. It is simply a mechanical appliance. There is no chemical effect contemplated, and certainly none can be expected. I know from my own personal knowledge that there are thousands and thousands of cases in which I know that by proper treatment, and restoring them to their normal condition, and then filling them, they can be permanently filled.

Dr. Weeks said:

I wish to ask Dr. Wetherbee whether his remark that filling with the oxychloride of zinc the entire cavity will in all cases cause the destruction of the nerve, is the result of actual experiment in such cases. Now, I have been using this filling for five or six years, and I think that I can say that five out of six are alive. Among the first cases in which I used it, I filled the entire cavity with it. After about a year I removed in two or three cases the entire amount of filling to see the condition, and found the nerve alive and doing well. In many other cases I have found that all appearances indicated the nerves to be alive. I have found them but slightly sensitive to cold, but to very cold or ice water, they were unmistakably so. I have had several cases where patients desired to have the space as it wore

down, built up with the same material, rather than have the display of gold in the teeth, and as nearly as I can determine, I should judge that the nerves were alive. When I removed the filling in a case where I had cut the nerve, it was alive and doing well, and I should like to know what length of time is required to cause the death of the nerve in these cases.

Dr. Wetherbee said:

I have not experimented to any great extent, with this filling the cavity entirely, with oxychloride of zinc. One case I now call to mind, the result of which was the death of the pulp. However good the material may be I believe it to be unworthy of your confidence when the surface of the filling comes in contact with the fluids of the mouth. One example which forcibly illustrates my position occurred: The teeth of a young lady who had six fillings of the above type inserted by a great lover of money and large professional pretensions; in less than six months five had washed out; the sixth I allowed to remain to test its durability. In less than three months it had lost seven-eighths ($\frac{7}{8}$) of its original bulk, with very extensive decay of the surrounding walls of the cavity. Its porosity, and being easily disintegrated, chipping here and there, make its use only allowable where it can be covered with an indestructible material. To facilitate the use of oxychloride in capping exposed pulps, it should be placed on a small piece of linen tape, which answers best for a vehicle to convey the preparation home. When the oxychloride has sufficiently hardened, the linen patch and the surplus should be removed to admit of a gold filling. I have no doubt of the very general success of any gentleman who adopts this mode of practice.

Dr. Weeks:—In reference to the porosity, I have found some instances where the dentine was dissolved, but only when it had become so wasted away that acids or impurities found a lodgment in the cavity, softening first the remainder of the filling, which then acted on, or permitted other substances to act on, the tooth. I have not been in the habit of filling with this material, except as a lining. I have not succeeded in saving every case, but have saved as many as five out of six.

Dr. Wetherbee:—It is due in connection with previous remarks that I make a further statement. I call to mind a case of two teeth which came under my notice. These teeth had been filled and re-filled for some three times, and all that in little less than three years. The patient said she was tired of this dissolving of the dentine and enlarging of the cavity, and wished to use gold. I removed the filling remaining of the oxychloride of zinc, to get into the cavity. The pulps in both these teeth were dead as it was possible to be. Now then, what was the cause of the death of those pulps? I believe the action of the chloric acid was one reason; I believe the porosity of the material was another reason, and certainly when too many agents of such harsh material are brought against the pulp, no wonder it occurred.

Dr. Horne:—The gentleman has let the cat out of the bag. Too much free acid! It was only necessary that the discussion should be carried out to the farthest limits, to show the very great danger that really existed, and yet to be proved in multitudes of cases which will arise, showing the free acid which that gentleman found in the oxychloride of zinc, and that that sleep is the sleep of death. They will keep quiet for a time. Two years are not sufficient to test such a matter as this. It has been called to mind by my friend from Chicago that it will not do for gentlemen to say they do not believe it. You see, sir, we take every man's testimony and word according to our own experience. We are not afraid any more of being talked to about our blackness. We would rather be black in order to become white, instead of coloring and flattering our own experience by continual errors. Now, sir, you want something for a temporary purpose, to preserve that delicate organ from all irritating substances, and then leave it to the healing influence of nature, and when you have attained that point, if your temporary filling still maintains so much of its excellence as to be perfect, then you can cut away your temporary filling and substitute your oxychloride of zinc, and it may do well if you have protected it from this acid, and you may be successful; but here is the point of success,—it is

not your oxychloride of zinc, *per se*, that is doing harm, it is only your acid material of the chloride.

Dr. Searle:—Of the chloride, I have faith in its use. I have decided since the last meeting that it is a success. Previous to that time I had met with no adverse circumstances in its use, being altogether in favor of it, so far as I *had* any faith, and I have entire confidence, at present, in the application of oxychloride of zinc. I suppose that these other applications are simply a dressing to restore the nerve to its vital energy, if the power of the constitution is not sufficient of itself to bring about this condition, and I expect some day to be able to give these cases a more thorough test.

Dr. Hitchcock said:

I am very glad the oxy-chloride stands some sort of chance here to-day. Two years ago, at Boston, it had no friends at all. The doctors were using gutta percha and gold, which seemed to have the preference over all others. I have been an advocate for the use of oxy-chloride as a capping since January, 1866. My first idea as to the use of oxy-chloride I got from Dr. Wadsworth, of Washington, who spoke in very high terms of it. If I had known the matter was coming up, I should have been glad to have prepared a list of cases which I have had, and treated with the oxy-chloride.

I wish to say a word on the application of creosote. Dr. Atkinson suggests that the entire pulp may be converted into albumen by its use, if I understand correctly. Now, I wish to throw out a suggestion. It is, as you are aware, only a short time since a patent has been obtained for the embalming of bodies,—for the preservation of bodies with carbolic acid, by washing with this preparation, and in this way preserving them. At the end of from four to six months the bodies have been opened and examined, and found to be unimpaired. In one case in particular, where the person had been dead some two months, the lungs were opened, and about a pint of pus was found in the cavity of the thorax, which was in as normal condition as could have been expected. All the features were perfectly preserved, and to all appearance the body was as fresh as when first preserved, two

days after death. They have even gone farther than that in the use of this preparation, and where some change has taken place on death, by washing the body with this solution a more natural appearance has been obtained, and the features have been partially restored, and decomposition arrested.

When this subject was first called to my attention, I reported a list of cases in 1867 to the Massachusetts Dental Society. I do not claim the use of it as successful in all cases. I do not claim that every exposed nerve will be saved by it, but I will say that they have been filled and preserved by the use of it where the nerve has been exposed, where the nerve has been inflamed, and the tooth has bled.

I have several cases in my mind now, where, after having decided upon making an application of the oxy-chloride of zinc, and being fearful at first as to what the result might be, I put in a temporary filling, and in a short time removed that and filled with gold. In 1867 I read a paper before the Massachusetts Dental Society, and gave a table of the number of cases I had had up to that time, and since then I have more cases than I had at that time, but I have not prepared them in any regular form.

It is very important that the oxychloride should be perfectly pure. That which is the whitest is not so pure as the yellow The yellowish-white is always purer than the perfectly white. The best preparation of the kind which I have ever used has been prepared by Dr. Treat. That which I have procured at the shops has never given me so much satisfaction. The chloride of zinc I have prepared myself, and my most successful method of preparing it has been by taking hydrochloric acid and preparing it from the metalic zinc. We should make the paste only thick enough to set hard. When it has too much of the chloride of zinc, a little bibulous paper may be used to absorb the excess. I often use it in that way. My method of manipulation is, to cut from a piece of linen a small piece, sufficient to cover over the part I wish to protect. The piece of linen is saturated with the oxychloride, and is then applied directly over the place it is desired to protect. After a few minutes I go on and fill with gold, unless it is some case where I am doubtful about it. I have

used it also where the nerve has been nearly exposed, and in every case which I have examined, I have found the pulp healthy, and the same as before making the application.

The hour of adjournment having arrived, the following operators were appointed for tomorrow's clinics:

Drs. Butler, McManus, Atkinson, Bannister, Morrison, Palmer, Wetherbee, Allen, and Southwick.

On motion, adjourned to meet at 8½ o'clock this evening, at the Spencer House.

THIRD DAY—EVENING SESSION.

The meeting was called to order at 9 o'clock by the President.

In the absence of the Secretary, Dr. Horne was appointed Secretary pro-tem.

On motion of Dr. Judd, the discussion on dental pathology and surgery was closed, and the committee on dental physiology was called. No report being made, the subject was passed.

The committee on dental chemistry presented the following paper on saliva, from the chairman, Dr. Chase, which was read by Dr. Wetherbee;

THE SALIVA.

BY

HENRY S. CHASE, M. D., D. D. S.

The saliva is not a simple fluid of the mouth, but rather a mixture of fluids and solids from various sources, within the buccal cavity.

To obtain a fair sample of this fluid, which I will call "mixed saliva," the teeth should be thoroughly cleansed with brush and water, and the interspaces also, by the use of a tooth pick. The mouth should be rinsed with clear water. After a half hour the

saliva may be evacuated, as often as the mouth fills, into a clean tumbler or large test tube.

It is evident that if one has lately partaken of a meal, that there will be particles of food adhering to the teeth, and between them, which if evacuated with the saliva would very much modify its physical character, and very likely also its chemical reactions.

For these reasons also the mouth should be free from tobacco or other juices produced by chewing, &c.

Mixed saliva is the product of the parotid glands, also the submaxillary and sublingual; and besides these we have a small secretion of mucus from the labial and buccal glands, the small glands of the palate, and the tonsils.

Besides this enumeration, large quantities of epithelial cells are constantly being cast into this fluid from every portion of the oral mucous membrane. Even the follicles of the tongue also contribute a small amount to the stream.

The parotid glands furnish the greatest volume of the saliva; next the submaxillary, followed by the sublingual. The parotid is the cleanest fluid, and has the greatest specific gravity, being according to Mitscherlich 1.0061 to 1.0088, while Jacubowitsch found the submaxillary fluid to be 1.0041.

The sublingual glands are very small, yet they furnish an abundant secretion, thicker and more tenacious than either the parotid or submaxillary on ordinary occasions, but when excited by the presence of a smooth metallic instrument or by pressure beneath the chin they pour out an abundant and clear fluid, often with such force as to drive it entirely out of the mouth; especially is this the case in dental operations.

The secretion from the various buccal, labial, palatal, lingual, and other glands is a thick, whitish and tenacious substance, and this, together with the epithelium, gives the turbid color to the freshly evacuated saliva, and also its principal deposit.

When saliva is first evacuated according to the directions before given it is a frothy, water-colored fluid, tinged with blue. Its slight viscidity has entangled numerous globules of air in its substance, and it is not until some minutes have elapsed that the air

has passed away and the fluid becomes in this respect homogeneous. By the time the air has disengaged itself, however, we may see a whitish deposit slowly accumulating in the bottom of the test tube. As the latter operation progresses the supernatant fluid becomes clearer, and at the end of twenty-four hours we will see a very clear fluid, with a bluish tinge, and at the bottom of the glass tube the deposit spoken of occupying about one-tenth of its depth, and its particles lying very loosely together. After two or three days in a warm place the deposit is much more compact, and has much the appearance of wheat flour.

When first evacuated from the mouth the saliva has a slightly disagreeable odor, which increases if allowed to stand for a few hours, as its animal matter is then undergoing chemical decomposition.

In health one's own saliva is tasteless before and immediately after evacuation, but that of another has taste and smell which is disagreeable, unless it happens to be of precisely the same character as one's own saliva.

Very soon after evacuation the saliva undergoes a chemical change which renders it still more objectionable to the taste.

In disease the saliva of the sick is in some cases constantly disagreeable to the patient, and often the first symptom one has of approaching sickness is the changed taste of that fluid.

Bilious saliva may be found in any condition of the system when abnormal quantities of bile are circulating in the blood, and the oral fluid has then a particularly "bilious taste."

Sweet saliva is found in many diseases,and especially in miasmatic intermittent fevers.

In my own case all starchy substances were instantly changed to glucose in the mouth; and eating of food containing starch in much quantity was rendered very offensive by the constant presence of sugar.

Sour saliva is more common that that having a sweetish taste. This is common in fevers and some other diseases. It may be rendered so by partaking inordinately of acids or of sugar, the latter being changed by a *chemical* process instead of being digested by physiological operations. Arsenious acid, in continued small doses, will also change the saliva to a very acidulous

state, as proven by litmus paper and the natural taste. The saliva will, in this case, cause all starchy and saccharine substances to taste sour, so rapid is the chemical change that it causes in these kinds of food.

The sour saliva caused by arsenic is so intense that it causes rapid chemical decay of the teeth, and especially around the necks of the teeth at the margin of the gums, and the teeth become exquisitely sensitive at these points, and besides that, the teeth are generally extremely sensitive to cold draughts of water or air.

Alkaline Saliva. In some diseases the saliva has a decided alkaline taste. It also has in health after partaking freely of alkaline carbonates.

The Quantity of Saliva as furnished by the same person varies at different times, depending on the condition of health, and also on the character of food partaken of. There are also many artificial stimulants to the salivary glands, such as table condiments, medicines, &c. A large number of metallic oxides produce a great increase of the saliva stream; among these are mercury, arsenic, lead, antimony, &c.

The largest quantity secreted in health is during the mastication of food, and this, too, varies according to the quantity of water which the food either naturally or artificially contains. Experiments on myself, a healthy person weighing one hundred and forty pounds, demonstrated the amount to be 850 grains in one hour. The experiment being commenced four hours after breakfast, reading a book during the time. Experiments at other times have not materially varied from this.

The dental profession know very well that there is a great difference in the amount of the salivary secretion during the performance of operations in the mouth. They find, too, that the parotid gland is not always the one which furnishes the greatest quantity of saliva, but on the other hand that the submaxillary and sublingual are far the most active. Other experimenters state the amount of saliva, as observed by them, from 500 grains to 1500 grains per hour. Considering then my own experiments to be about the *average* quantity, it will be seen that for twenty-

four hours the stream would increase to the astonishing amount of forty-three ounces. Allowing a reduction of 33 per cent. an hour during the eight hours of sleep, and we still have forty ounces.

Dalton estimates the quantity for the same time at a little less than three pounds.

That a large amount of saliva is secreted during sleep one may observe in the involuntary act of swallowing by the sleeper. Some who do *not* swallow the saliva during sleep are much incommoded by the secretion running from the mouth, and wetting the pillow and bed clothes.

Colin states that the activity of the different glands is produced either on one side of the mouth or the other, according to the side upon which mastication is in progress.

In animals which do not masticate there are only rudimentary salivary glands ; and in those which masticate but little they are but partially developed.

The Chemical Composition of Saliva varies in different individuals and animals, as well as in different conditions of the system. Therefore the analyses of mixed saliva have not been the same by different observers, although the difference is mainly in the relative proportions of water and solid constituents.

The following by Bidder and Schmidt is one of the most reliable :

COMPOSITION OF HUMAN SALIVA.

Water,	995.16
Epithelium,	1.62
Soluble organic matter,	1.34
Sulphocyanide of potassium,	0.06
Phosphates of soda, lime and magnesia,	0.98
Chloride of potassium, Chloride of sodium,	0.84
	1000.00

In speaking of the physical properties of saliva I mentioned the apparently large amount of organic matter in the saliva. Most of this will remain upon the filter, but a small portion passes through, as does also the *mineral* constituents, being soluble.

The solid portions of saliva are much increased in some diseases and under some physiological conditions. In cases where the kidneys do not perform their duty a larger amount of salts are found in the saliva, evidently the effete materials of nutrition. Persons who indulge largely in fresh meats also have a greater quantity of not only salts, but of organic matter in the saliva. Vegetable food also, rich in lime salts, increases their amonnt in the saliva. And in those animals whose food is of this character, it is particularly observed, especially in the horse and cow.

Of the inorganic ingredients, the sulphocyanide of potassium is the least, but on the other hand it is a very constant one. I have not failed to detect it in any case by evaporation of a portion of the fluid; and that from my own mouth has always yielded the result, just as it was evacuated from the cavity. The test used was the perchloride of iron. Whenever eggs were freely eaten, the sulphocyanogen seemed to be increased, the red color produced being more intense.

Wright states that prussic acid, the salts of cyanogen and sulphur taken internally increase the quantity of sulphocyanogen in the saliva.

The salts of lime, soda, and potash are also very constant ingredients of saliva, but vary in different individuals of the human species, and in different animals. In the horse and cow the proportion of these salts is much greater than in man, which may perhaps be accounted for by their more *natural* mode of life.

It is these salts which give alkalinity to the saliva in these animals, and also to that of the human species when it *is* alkaline.

These salts together with the organic matter is that which composes the "tartar" or dental calculi.

The *chemical reaction* of fresh saliva as it is found in the human species is nearly always acid or neutral. I have tested the saliva of over two hundred persons within the last six weeks and have found all acid but two, and they were both neutral. In the commencement of my experiment I was very much surprised at the result, for I had learned from the books that it was invari-

ably alkaline. Lehmann states that it is acid in *fasting*, and in some diseases.

Flint states that it is almost invariably alkaline.

Dalton states "the alkaline reaction varies during the day, but is nearly always sufficiently distinct."

In addition to my own experiments I have obtained the assistance of several physicians, who have reported more than fifty cases, all going to show the *acidity* instead of the alkalinity of the mixed saliva.

Women enciente gave a more intense red to the litmus than others. This may be owing to the great demand for the alkaline phosphates to build up the osseous tissues of the child.

In fevers and acute inflammations the saliva showed also very much greater acidity.

Some nursing infants showed the saliva neutral. All but these infants lived on a mixed diet of meat and vegetables. Their habits of life were various, some approaching a physiological standard nearer than others. Those having the most natural habits came nearest to a neutral reaction of the saliva.

Reasoning from physiological premises, I have always regarded the saliva alkaline, without testing it. It would seem that for the preservation of the teeth it should be so, and when I found my experiments had overthrown my preconceived ideas I thought that it must be owing to the artificial mode of life in mankind, and that if I studied the subject among the lower animals I might find quite a difference between the chemical reaction of their saliva and that of human kind.

My attention was first directed to a well arranged livery stable where the horses had excellent care, being fed exclusively on good hay and oats and pure river water. They were clean and had daily exercise.

Ten (10) horses were examined who were in good health. The saliva of all was *decidedly alkaline*. One horse who ate his rations, but who had been blistered for pneumonia had a neutral saliva. At another stable where the horses were equally well cared for the reaction was equally decidedly alkaline. Both litmus and turmeric paper were used in these experiments. Some

of these animals were mares, and others were geldings. No natural males.

My next visit was to a cow stable, in the city, containing one hundred and fifty cows. The building was badly ventilated and badly drained, and very hot. The *feed* was poor hay and "ship feed." A large number of these cows were examined, and the saliva in *no* case was found to be alkaline.

Many of them were decidedly acid, some faintly so, and others neutral. It is my opinion that if these cows had been in a physiological condition their saliva would have been alkaline. For in a subsequent examination of several country-fed cows living upon grass at pasture their saliva was alkaline.

A mare with foal at grass had alkaline saliva. Several male and female dogs had a neutral saliva. All the horses and cows examined were eating.

I have examined about fifty persons one minute after they had finished a meal. Some after each of the three meals of the day. In every case the saliva was neutral. In half an hour after, an examination of the same persons showed a decided acid reaction. The same persons were also examined one minute before a meal and the saliva was acid.

There is strong ground then for concluding that the normal condition of the saliva should be *alkaline* in man as well as in all other animals. That a departure from a truly physiological state causes that fluid to be either neutral or acid. Also that nature makes a strong effort to place the saliva in a physiological condition at the time food is being masticated preparatory to stomach digestion.

Acid fruits, condiments, and drinks do not prevent the saliva from being alkaline during and immediately after eating.

Drinking a sour wine had the effect for a half hour afterwards to render the saliva neutral, which immediately before was distinctly acid.

The Office of the Saliva has been, and still is, in much dispute; many contending for its merely mechanical or physical function, and others equally strenuous that it has only a chemical work to do. I think that both are wrong. It is very evident that dry

food could not be swallowed without being moistened in the mouth. The last act that the oral cavity has to perform is to furnish from the tonsils and palatal glands a glairy mucus to varnish the bolus with that it may be *easily* swallowed.

We have seen that the saliva contains considerable air. The permeation of food by the air and water of the saliva renders its digestion more easy. For the law of the diffusion of fluids and gases would ensure an early penetration of the gastric juice through the alimentary bolus, and thus facilitate the digestive process.

The experiments of many observers go to prove abuudantly that the *starch* contained in food is immediately acted upon chemically by the saliva, and that portions of it are soon converted into glucose. This will take place out of the mouth, as well as in it, provided the natural warmth of the body is maintained in the fluid.

We have seen that the quantity of saliva secreted is between two and a half and three pounds. This is much more than sufficient to moisten the food, and we find too that the secretion continues between the periods of eating; therefore we may well suppose that the saliva has other uses. One of these may be to prevent thirst by bringing from the blood a comparatively pure liquid which may moisten the mouth and throat, and continue to assist in the digestive process after the food has passed into the stomach. The speech becomes difficult when the saliva ceases to flow, as it often does from some mental excitement, or pathological state.

A still more important function, is the preservation of the teeth by bathing them in an alkaline fluid which shall neutralize any acids formed around and between them from the decomposition of food. This is undoubtedly the case among the most natural livers. But we have seen that the saliva of civilized man is neutral or acid, and this latter condition has a very deleterious influence on the dental organs.

Food remaining between the teeth for half an hour in the mouth of a person having moderately acid saliva, will become much more acid than the saliva itself, as the intensity of the reaction

on the litmus will show. Lean meats in particular show this, as the acid formed from them is nitrous or nitric.

How important, then, it is, that people should return to a more rational system of living, both as regards diet, and other habits of life. Undoubtedly one cause of acidulous saliva is to be found in the fact that so many people make extravagant use of fine flour, from which the miller has removed the greater portion of the alkaline phosphates, such as lime, soda and magnesia.

I have before said that the stream of saliva amounts to about forty-two ounces daily. According to the analysis of that fluid already given, it may be seen that there is about forty grains of alkaline substances in that amount of saliva, which should have an important influence in correcting the acidity of the mouth from the decomposition of food and effete epithelium of the mucous membrane. I have found the latter substance yielding invariably a more intense acid reaction than the saliva.

Undoubtedly the mixed saliva is materially influenced in its acid reactions by this cast-off epithelium.

A person may brush the teeth thoroughly with clean water, and also thoroughly cleanse the mucous membrane of the mouth with water, and then find the saliva very *slightly* acid. In half an hour from that time the saliva will be found with a far more intense acid reaction.

Besides the uses of the saliva already discussed we may consider it a fountain, deriving its supply from the streams pouring into the mouth from the various glands, and sending the conjoined streams down the æsophagus into the stomach, thence to be absorbed into the blood to keep up its volume and furnish the ultimate cells with a fluid by which their chemico-vital processes can be carried on with facility, thus giving the system an opportunity for economizing both water and the mineral elements of which all the tissues are composed.

In health we must not consider the saliva an *excretion*, it only becomes in a measure so, in some pathological conditions; therefore we must not hold the mineral constituents of saliva to be *effete*, as we are bound to do in the case of URINE.

In concluding the subject, upon many interesting points of

which I have barely touched, and some of which I have not mentioned, I will indulge in a few general considerations:

There is yet much to be done in the way of chemical analysis before an exhaustive history of the saliva can be written. Those analyses which have been made do not state what the diet of the individual was, or his other habits of life. It is certain that experiments made during pathological, or doubtful physiological conditions should be received with considerable allowance.

Food rich in alkaline phosphates and carbonates increases the percentage of these salts in the current of blood and of the saliva, and therefore it is of much consequence, that the kind of food which made the blood should be noted, and the *proportionate quantity* of the different articles of diet also.

The large amount of organic matter in the saliva should caution us as dentists against the incorporations of that fluid in our gold plugs for the restoration of the teeth.

The mere wetting the gold in the process of filling, causing non-adhesion, can be but a small part of the injury to the operation, as we may well suppose that the organic matter combined with the saliva and intermixed with gold foil or gold sponge, would soon undergo decomposition, and by the expansion of gases loosen the plug, and blacken the dentine, resulting in a continued decay of the tooth.

This organic matter which is seen at the bottom of the test tube is not *all* the organic matter contained in the saliva, a considerable amount remains in solution, and it is in the latter that the ptyalin is found, which is supposed to be the true salivary principle upon which the first process of digestion is dependent.

The organic matter *deposited*, is seen under the microscope to be composed of epithelial scales, mucous corpuscles and fat globules. If the mouth has not been thoroughly cleansed, of course there will be the remains of particles of food, and if there be carious teeth there may be vibriones or cellular growths washed from the cavities of decay into the saliva stream. But this *deposited* organic matter is also able to change starch into glucose, when a proper temperature is maintained, and longer time given;

and *Flint* states that the serum of the blood, cystic fluid, and intestinal juices have similar power.

Dr. Atkinson desired to make a few statements.

In the first place, all these experiments ought to have been very carefully conducted, and it is assuming too much to expect that the tyro in these can do as well alone as when under the auspices of men who have spent their lives in such investigations. Acknowledging all the advantages of the later nomenclature in chemistry, and the very great light that has been thrown on these investigations by microscopic science, still I feel that there is an important question to ask in all these investigations, and that is, what do you mean by acidity and alkalinity? There are two causes of acidification, and in order to determine whether any body is acid or not, we must first determine the atmosphere in which it is, so that if the fluid were absolutely alkaline at the instant of its being discharged from the orifice of the ducts—these little laboratories of saliva—although it might be alkaline, and highly charged with this condition, in its passage into the mouth it might become acidified so as to render a test entirely out of the question.

We must look very closely into these matters. We must count ourselves able to take hold of these investigations with some sort of vigor, and we should not endorse a vote of thanks for such an entire failure of coming to anything like a conclusion, as this paper has been, but we must remember that we are but a set of infants, at best, and must support each other, but we must nevertheless understand the lesson that we pretend to teach. Where are there any reliable codified investigations of dentistry or medicine, so-called, to be found? I object to adopting any such paper as that any further than referring it to the proper committee.

Dr. Wetherbee said:

In the absence of Dr. Chase, the author of the paper, it may be proper for me to state my regret at so poor a reading of his report. I believe that the experiments which he has given in that paper—many of them being of like character and uniformity—must convince us of his ability to weigh to some extent human

knowledge, and sufficiently erudite to understand *also* very many of the conclusions arrived at. I have no doubt if he were present he would be able to so elucidate his statements as to make an absolute convert, to many points, of our distinguished brother Atkinson. I believe that the test which he gave the cows under varying conditions, the one well fed and well cared for, the saliva was normal in quality, while in others not well fed, well housed or cared for, the saliva was quite different. I think, therefore, that there are a sufficient number of facts and suggestions in this report to awaken an earnestness which shall lead to a careful consideration of the subject.

Therefore I hope no gentleman will denounce any paper as not in accordance with truth until he shall have clearly shown such to be the fact, and shall have made it *plain to the mental comprehensions* of all who are seeking the crest of the broad waves of light, that erroneous doctrines have been advanced, and also show unto us a more excellent way. In the exercise of a large charity let us away with, as well as repudiate impertinent criticism.

Dr. Judd said:

In regard to the report that has been read, I would state that I am aware that Dr. Chase has been experimenting, to a certain extent, on this subject. Now, I am just as well aware as Dr. Atkinson, or any other man, that a great variety of experiments is necessary to settle any one of these points. They must be tried under every circumstance that can be imagined. I am very far from desiring to be understood here as stating that I consider this question of the alkalinity or acidity of the saliva as established by this comparatively small number of observations or experiments, but I believe, nevertheless, that there is something in this. I have no doubt but what the observations that have been recorded in that paper have been made, and I have no doubt, but in a great number of instances the mixed saliva of the mouth will be found, if tested, to be acid. Now, it may be questioned as to whether this will be confined to certain localities or not; whether it will be confined to persons in certain conditions of health or not; and whether it will be influenced by this or that circumstance. The

experiments are entirely too limited to settle these points, but I suppose that a few experiments are vastly better than none. I have made perhaps a half a dozen experiments myself upon the effects of nitrous oxide gas upon animals, but have not made enough to settle anything yet, but I would rather have the little information I have gained on certain points by these experiments, than all I have ever gained from the discussions on this subject since this has been a subject of discussion with the profession at all. I am very well aware it is a difficult thing to settle that experiment, and so is this other that we are to solve. Since Dr. Chase has been experimenting on this subject, I have occasionally placed a piece of litmus paper in the mouth of a patient, and in a good many instances in which I have tried it,—not enough to settle this question, however,—the litmus paper has been tinged decidedly red. In some cases the color was a marked red when withdrawn from the mouth. In other cases the red color was a short time in making its appearance, but there is no question but that it was decidedly colored when it was withdrawn from the mouth in a good many cases; I have seen these experiments tried to a certain extent, in the mouths of persons suffering from decayed teeth, and in these cases the redness was much more marked than in the ordinary cases, and this points to the conclusion that the acids of the mouth are the principal cause of decay of the teeth.

It has been stated that in the experiments detailed in this paper, the redness of the vegetable blue color of the test paper was probably produced by the action of the oxygen of the atmosphere after the paper was withdrawn from the mouth; but if this had been the case, how did it happen that different results were reached whilst experimenting upon the saliva of animals in a healthy condition? The same sources of error were present in the one case as in the other, but in the latter case the oxygen of the atmosphere failed to bring out the red color characteristic of acidity.

In regard to the experiments of Dr. Chase, I think we should publish the paper, as we do all other papers, as I think it is a valuable one.

The Association then adjourned till 10 o'clock Friday morning.

FOURTH DAY—MORNING SESSION.

The Association met pursuant to adjournment.

Minutes of last two sessions read and approved.

The President announced, that for ten minutes miscellaneous business would be in order.

On motion of Dr. Templeton,

Resolved: That this Association recommend to the profession, in those states where no law exists for the protection of the profession, that they take action as soon as practicable to procure such legislation.

The chairman of nominating committee on standing committees, presented the following report:

Mr. President: Your committee on nominations would report the following

Committee of Arrangements: Drs. J. G. Ambler, of New York; L. W. Rogers, of Utica, and L. S. Straw, of Newburgh, N. Y.

Committee on Pathology: Drs. W. H. Atkinson and J. S. Latimer, of New York; Moses DeCamp, of Mansfield, Ohio; Geo. S. Moffatt, of Boston, and A. B. Robins, of Meadsville, Pa.

Committee on Physiology: Drs. W. H. Morgan, of Nashville, Tenn.; A. Westcott, of Syracuse, N. Y., and H. S. Chase, of St. Louis.

Committee on Chemistry: Drs. T. L. Buckingham, of Philadelphia; H. A. Smith, of Cincinnati, and A. Lawrence, of Lowell.

Committee on Education: Drs. J. Taft, of Cincinnati; F. J. S. Gorgas, of Baltimore, and M. S. Dean, of Chicago.

Committee on Dental Literature: Drs. R. W. Brown, of New London: L. D. Shepherd, of Boston, and J. McManus, of Hartford.

Committee on Histology and Microscopy: Drs. J. H. McQuillen, of Philadelphia; W. W. Allport, of Chicago, and J. S. Dodge, Jr., of New York.

Committee on Operative Dentistry: Drs. C. R. Butler, of

Cleveland; J. S. Knapp, of New Orleans, and Wm. H. Allen, of New York.

Committee on Mechanical Dentistry: Drs. John Allen, and Norman W. Kingsley, of New York; C. H. Harroun, of Toledo; J. A. McClelland, of Louisville, and S. B. Palmer, of Syracuse, N. Y.

Committee on Prize Essays: Drs. G. H. Cushing, of Chicago; A. L. Northrup, of New York; W. F. Morrill, of New Albany, Ind.; C. E. Francis, of New York, and F. N. Seabury, of Providence, R. I.

Committee on Voluntary Essays: Drs. M. S. Dean, of Chicago; A. M. Moore, of Lafayette, Ind., and H. P. Horton, of Cleveland.

Committee on Dental Therapeutics: Drs. E. A. Bogue, of New York; I. J. Wetherbee, of Boston, and A. P. Merrill, of New York.

Committee on Publication: Drs. Homer Judd, Edgar Park, and W. N. Morrison, of S. Louis.

Committee on Surgical Appliances and Instruments: Drs. W. C. Horne, of New York; Corydon Palmer, of Warren, Ohio, and J. A. Bishop, of New York.

The report was accepted, and the nominations confirmed.

On motion, discussion on the subject of Dental Chemistry was closed.

The committee on Dental Education was called upon, and Dr. Judd, chairman of that Committee, made the following report:

REPORT OF THE COMMITTEE

ON

DENTAL EDUCATION.

HOMER JUDD, CHAIRMAN.

Mr. President: The committee appointed at the last annual meeting of the Association to report upon Dental Education have taken the subject under consideration, and beg leave to submit the following as the result of their deliberations:

Education, as defined by Webster, "comprehends all that series of instruction and discipline which is intended to enlighten the understanding, correct the temper, and form the manners and habits of youth, and fit them for usefulness in their future stations." Although this definition is far from being elegant, concise or exhaustive, still it suffices to show that education has reference to something more than an accumulation of knowledge, and that it comprises also the idea of a mental discipline or training which may be properly expressed by the word culture. It seems, therefore, that the subject might be divided into two parts, the first having reference particularly to the acquisition of a knowledge of the practical details of dentistry, whilst the other would refer more particularly to that course of mental culture which marks the dividing line between the tradesman or mechanic and the professional man. In relation to the first mentioned part, the evidences of progress are manifold and flattering, but there still exists a necessity for stimulating the individual members of the profession to increased efforts in this direction, and our Dental Journals should not proceed in their educational efforts upon the idea that their duties consist entirely in dissem-

inating theories, and in chronicling facts that are altogether new; but they should keep steadily in mind the fact that the great want to be supplied is a general dissemination of the facts already known. It might be replied to this proposition that our standard text books supply the medium through which this should be attained. But dental text books, like all other text books, are as a general thing so far behind the times when they are placed in the hands of the profession, that were they generally accessible, they would to a very great extent fail to accomplish their object; and when we take into consideration the fact that a much greater proportion of the members of the profession do really read the journals than the text books, the importance of the latter as a means of disseminating useful knowledge may be readily estimated. The increased interest manifested in dental associations and conventions, and the increasing number and respectability of such societies furnish gratifying evidences of the awakened spirit of the age, and point with unerring certainty to a corresponding degree of progress in this direction. But whilst this general dissemination of knowledge is all important to the practitioner, we must not forget that the standing of the profession itself does not depend to any great extent upon the amount of knowledge of dentistry which its members may possess, but that its position among the liberal professions is determined rather by the culture of its members and their literary acquirements. It is probably true that many enter upon the study of a profession with but little thought of the responsibilities which attach themselves to professional life; and it may be well to remark in this connection that study and investigation is a part of the daily duty of every professional man, and he who does not give a part of his time to study and scientific inquiry is wanting in one of the first requisites that pertain to professional men, and is doing not only an injury to his patrons, but also to himself and to the profession to which he belongs. It is objected by some that they have no time to study, or in other words, that they have no time to attend to the calling which they have chosen as the business of their lives. Now one may retain his self respect and the respect of others if he fails to answer all the demands for service made upon him by

patients, but he can do neither if he fails to apply himself daily to those studies and investigations which are required in order to enable him to maintain his position as a man of learning and of science.

Progressive advancement in culture is not so readily made manifest to the casual observer as is that of the first division of which we have spoken, but the thoughtful and studious are assiduous in their efforts in that direction, and there can be no failure in their attempts to accomplish these satisfactory results. These laudable efforts on the part of a few members of the profession have been seconded by a growing public opinion in communities which calls for intelligence and urbanity, and scientific and professional acquirements in their dental advisers, and we therefore regard the future as full of promise.

We have thus far refrained from mentioning our collegiate institutions of learning, and we now turn to them for the purpose of expressing our appreciation of their efforts in this great educational movement that is now going on, and which is destined to place the profession upon a higher level than it has yet occupied, and to increase its usefulness to a corresponding degree. For the purpose of acquiring the practical details of dentistry our dental colleges furnish facilities which can not be enjoyed by students in private offices, and the benefits of which can scarcely be over-estimated. The influences which colleges of dentistry are to exercise, however, upon the professional status will depend more upon what they demand as requisites for admittance to their classes than upon the curriculum of study which is pursued within their walls, for it will be readily admitted that to a great extent, that part of an education which consists in mental culture or training is usually acquired in other schools than those that are specifically connected with the dental profession. Bnt whilst according to dental schools a high degree of praise for what they have accomplished, we must not forget for a moment that this educational movement can only be carried on and sustained by the united efforts of the honest, intelligent and energetic working members of the profession. The interests at stake are too weighty to be committed confidently to the keeping of dental collegiate

institutions alone, for all human institutions are fallible and liable to be influenced by unworthy motives if left uncontrolled by the profession at large; and should schools of dentistry be found willing to sacrifice the standing of the profession itself, and compromise its dignity and respectability in order to increase their pecuniary receipts or gratify an ambition for showing long lists of names upon their catalogues, the controlling influence of the public opinion of the profession would become necessary, and the expression of that opinion should be clearly manifested by the action of the representatives of the various local associations, conventions and societies convened in the American Dental Association.

The great body of honest practitioners are deeply interested in the status of the profession, and are earnest in their endeavors to increase its usefulness, and elevate the standard of its requirements, and in their hands we may rest assured that these interests are safe, and that their united voice is ever "upward and onward."

Judging the progress of dentistry by the number of students in attendance upon our collegiate institutions during the last year, as compared with the preceding year, we should not be flattered by the exhibit; but when we reflect that as a general rule, there was a higher standard required of students, and that the last year has been one of considerable pecuniary embarrassment, we shall be able to account for the disparity of numbers, without ascribing it to any want of interest in the profession, or any dissatisfaction with the course pursued by the associated colleges of dentistry.

Efforts for the organization of new schools of dentistry in New Orleans and Boston seem to have been successful, and we shall be most happy to welcome all new laborers in the great field of dental education who enter upon the work with the ability and honest desire to promote the general good, uphold the honor and standing of the profession, and at all times, and by every word and act, show unmistakably that they are honestly enlisted in the cause of dental progress.

It seems proper to remark in this connection, that the reverence which has hitherto been felt for a diploma, *per se*, clothed with the forms of law, has, in consequence of circumstances which have

transpired in the last two years, been rudely swept away, and that henceforth the value of each diploma will be determined entirely by the standing of the school from which it emanates. As a consequence, we must naturally expect that diplomas will soon be held by the profession as representing very different values; for diplomas are valuable as certificates, and lawful and proper certificates, and, I may say, the only lawful and proper certificates of qualification.

A diploma from one institution will be generally recognized as a certificate of a higher grade of qualification than another, whilst some of these certificates will be so slightly esteemed, that the possessor of one will be barely tolerated by professional men, whilst another class, which are already in existence, will ever stamp the holder with a disgrace so damning, that he will be regarded by the honest members of the profession as if the mark of Cain were stamped upon his forehead, or as if he were covered with the signs of a moral leprosy.

Every school must fix the value of its own certificates; for the judgment of the profession will finally be just.

Claiming as we do, to be a specialty of medicine, we must acknowledge that there are some peculiarities attached to our position as dentists which merit a passing notice, and in which we differ materially from other specialists: An oculist, for instance, first takes a degree in general medicine, and then applies himself to the study of his special department; so with the aurist; so with every other specialist of medicine, and any one who should attempt to enter upon the practice of any one of these specialties without this preliminary training, would be denounced by all honest and intelligent men as an impostor; and yet this is still tolerated in those who devote themselves to the diseases of the mouth, not only by intelligent communities, but also by honorable members of the medical profession; but, if the signs of the times are not deceptive, this toleration will not always last, and in this respect the common sense of thinking men cannot fail to place us at a disadvantage when we are compared with other specialists.

Now, there is but one remedy for the anomalous condition of

things, and that is to extend the course of study until it covers the same time and extent that is required by other specialists; and though this might require another year of study, and a small additional expense to the student, it is absolutely necessary in order to place the profession upon a level with those who have attained this higher position by a more extended course of study than has hitherto been marked out by our own collegiate institutions, but which the growing importance and respectibility of our specialty imperatively demands.

The following paper, by Dr. S. J. Cobb, of Nashville, was presented by Dr. Morgan, and read by the Secretary:

DENTAL EDUCATION.

BY

DR. S. J. COBB.

Mr. President:

As it is not convenient for me to be with you at your present meeting, I have written a few lines upon the subject of education, which I will, with your consent, offer to the Society:

All reflective minds agree that the determination of the best method of disciplining and developing the intellect, is of all subjects the most important.

Aside from the mere instincts, education makes man what you find him any and every where upon the face of the earth. The mind of man is evidently the superior part of creation, the last link in the chain, the key-stone in the arch, and when he has cultivated, trained and developed his varied powers to their full extent, as his Creator intended him to do, he stands out clearly and distinctly, the highest, *noblest*, BEST of all created matter.

Now, as we find man destined to fill this high and noble sphere in life, it is easy to be seen that there is work for him to do, in order that he may well and worthily occupy this place allotted to him. He is not only commanded to feed and nourish the body by the sweat of the brow, but equally well the mind.

The cultivated mind with the sound body, or as the old Latins had it "sana mens in sano corpore," give us a noble being but little lower than the angels, capable of almost infinite progression, even in this finite state, pre-eminently the highest and best of all the excellent and the beautiful which sprang into existence at the fiat of the Almighty. To reach, then, anything like the degree of excellence man is capable of, a vast amount of labor must be performed, commensurate with the immensity and magnificence of the field open to him; and as there is a right and wrong way of doing everything, it is all important that this thing we call education should be understood; the best methods applied upon the best principles. Mere information upon a world of mere facts, if you please, does not fill my idea of an educated mind. We have all seen men who were scholars, but brutes withal; the moral man, the finer sensibilities had been left uncultivated. Such men are often powerful for evil, worthless so far as performing the great work of life, sinful, debased souls possessed of many gifts. This demonstrates that their minds had not been properly shaped and trained; in other words, they had not been educated aright.

Now I have reached a point where I wish to address myself directly to our profession:

It has been wisely said that "as the twig is bent so the tree groweth up." Now, gentlemen, as our profession is, comparitively speaking, yet in its infancy, let us see that the twig is so bent that the tree may come forth not only bearing good fruit, but the very best of fruit. It is in the power of our profession to make it pretty much what we desire it to be. I am perfectly aware that men differ very materially, in many respects, and about many things. We must of necessity differ to some extent in our views and capacities, but the difference is too great.

There are two great causes of this divergence: one is legiti-

mate, and can't be helped, the other, in my judgment, can, and should be remedied. The legitimate cause of our difference grows out of the natural difference in intellect; the illegitimate comes from education. There is a great wrong somewhere in our educational system. It is evident to me that we do not keep in view as we should, the very thing, and the only thing, that can make us what we desire to be: I mean true principle—honesty of purpose.

In all our educational work we must have an eye single to that great essential; we must base every act that goes to shape and train the mind upon true principle, otherwise we never can accomplish the great amount of good that we promise the people. While I am an advocate of honesty, in all things and under all circumstances, I am a special advocate of honest dentistry, for it seems to me that we can promise ourselves less success by a different course in it, than in any other branch of business.

It is said there are cases in which physicians may, with propriety, administer bread pills,—a little good talk, a few flourishes of the hand in making up the dough, will give the pills a very happy effect. We frequently meet with tradesmen who tell beautiful stories, and discourse most eloquently about their wares, for which we pay them twice as much as the article is really worth, and on we go rejoicing, thinking ourselves better by both trade and medicine.

It is not hard to find, in every branch of business, circumstances under which men can sacrifice principles, apparently with more propriety, if not with greater success, than we can. I do not mean to say that it is ever right to wilfully deceive in any business transaction, but taking a purely pecuniary view of the question, it seems to me that this kind of sharpness pays better in any other walk in life than in ours. Bread pills and fine talking won't wear in dentistry. Bread plugs will come out, in spite of our eloquence, and leave the teeth monuments of duplicity. We must have better work than this.

It is certain that we need the very best men to practice dentistry; none but the best can do the work. It may be asked, can that class of men be procured? I answer, yes, I think it

possible, and the way to get them is as you would get men to do anything else, and especially anything of great importance: prepare them, educate them especially for this work. How is it that we have so many different churches, each one with its long list of faithful members? and how is it that we have so many different nations, adhering to different systems of government; and in each one of these governments, different political parties with their ever-living advocates. Does all this happen to be a fact without any effort upon the part of anybody? Not at all. It requires work, and no little of it. These people have been educated to do these things. It is no mistake that man is essentially the creature of education. How is it with armies? are they not prepared and trained to do anything that may become necessary, to endure privation, to march to certain death without a murmur? Our recent unhappy war furnishes a notable example of this kind, that men can be prepared to do almost anything. I believe it is generally conceded, that if Mr. Lincoln had issued his emancipation proclamation immediately upon the organization of his army, it would have been the means of destroying its efficiency to a very great extent. But a very short time sufficed to prepare the great Army of the United States to fight as hard to sustain that proclamation, as any order issued during the war.

As you see, it is only necessary to do a little work in the way of educating and preparing men, to get them to do whatever you desire. It is vastly important, then, that each and every member of our profession, and especially the leading spirits, direct their attention to preparing men to do just such work as is necessary to make dentistry what it should be.

I do not mean by this, that nothing has been done. A great deal has been done, especially in the last twenty-five years; but there is a vast amount yet to be done, and we must see that it is done, and well done at that. We need not go back many years to find our profession in the hands of a set of men utterly unworthy of confidence. Men of fine minds soon discovered the importance of dentistry, and the necessity of calling into the profession a superior class of intellect.

We have many noble men, many bright intellects now, but not

near enough compared to the immensity of the work. We must have more minds trained to the work. We must elevate the standard of our profession, until none but honest and thoroughly educated men can reach it. This cannot be done in a few years, it will require much time and great effort upon the part of our educators; but let us push the work bravely on, and every step made is so much clearly gained. We must not be discouraged at temporary rebuffs or defeats, but must persevere in the noble work, until victory crowns our efforts. We all know what is necessary in order to perform a first-class operation, in the way of filling or building up the crown of a tooth: We have, in the first place to procure the very best of material, in the second place this material must be properly and thoroughly prepared. Without either of these requirements we may plod along to the end of our lives and never perform one first-class operation. To obtain the best results we must use the best materials. Especially is this true in our profession.

In the past, of necessity, perhaps, in many cases we have used inferior material, but we promise better things for the future. We must look well to this point. It is especially the duty of our teachers and leading spirits to see that less of this kind of material is worked into our profession. We must have none but high minded, honorable and educated young men to enter our profession. We must encourage no other kind to enter it. This class of young men properly instructed in anatomy, physiology, pathology, dental pathology, dental hygiene, dental medicine, chemistry, microscopy, metallurgy, mechanical and operative dentistry will soon, after graduating at our colleges, using such text books, begin to show to the people the importance of our profession.

Much has already been done, I grant you, in this direction. We have demonstrated clearly, to a great number of individuals, the importance of our profession. Still it is a fact beyond dispute that the people as a mass have yet to be educated up to a proper appreciation of dentistry. There is much to be done in the way of raising the standard as regards ourselves, and still more as regards the people at large. The people must be made to realize the importance of our profession, then they will encour-

age it, then and only then can we reach that degree of excellence we talk so much of.

Our present means of reaching the masses are not sufficient. We must adopt a course of instruction that will reach directly the entire people. They must be convinced that we are indispensable to them. Our services will then be in demand and of course properly appreciated. I regret greatly that the Peoples' Dental Journal, a most excellent publication gotten up in Chicago, some years since, has been suspended. I think such a journal extensively circulated, would accomplish a great and good work. Such publications would furnish the masses with a good dental regimen. That would be what I call doctoring upon true principle, preventing as well as curing disease.

We are in this regard very defective, as is all the medical profession generally. The duty of the physician is not only to remove from the system, but to prevent the development of disease. In our profession also it is incumbent on us to teach the people not only the means of saving, but also of improving their teeth.

In addition to a journal, I am of the opinion we can furnish dental lessons for school books, in that way easily, readily, and effectually reaching the masses.

At a meeting of the American Dental Convention at Detroit, Michigan, four years ago, I advocated in addition to every other means used, this method of enlightening the people in regard to dentistry. I still think it entirely feasible, at least so far as regards rudimental instruction. It has three advantages over all other methods. The first is, we get at the entire people; the second is we get at them when young, before their teeth have time to decay; and the third is, we get at the mind when it is more susceptible of good and indelible impressions. These are very important considerations, and sufficient in my judgment to establish the propriety of carrying the idea into execution. The effect upon the rising generation, as regards our profession, would be far-reaching and incalculable. Not only vastly enlarging the actual practice, but bringing in hosts of intelligent young men to further the good work, young men who will commence the study of the profession with a good foundation whereon to build their

future dental edifice, with a fair general knowledge of the subject obtained from these readings in school and college, with minds thereby prepared easily and readily to take a thorough dental training.

Furthermore, it seems to me that the time has come when we should be able to pay back, to some extent at least, the long and liberal drafts made by us on the medical profession. We have drawn very largely upon their library ever since dentistry became a specialty. Our text books to-day are almost exclusively the works of the general practitioner. There is of course no objection to the use of their works; on the contrary it is our duty to avail ourselves of information from any and every source entirely reliable. But while doing this—while studying these books and cheerfully acknowledging our indebtedness to them—is it not our duty to furnish them something to study?

I am no egotist, but I certainly think our profession ought to, and will some day, produce text books on certain branches superior to any now in use by the medical profession. We have in our ranks to-day, men capable of producing works on various subjects, which would find their way into the general medical library, and become permanent fixtures. For instance, in my judgment we can so improve upon the present works on physiology, pathology and hygiene as to put the general practitioner under obligations to us.

In this way we can become his peer in every respect. In some branches, in my opinion, our profession is peculiarly fitted to furnish text books.

For example, we operate directly and principally upon the hard tissues of man, and in regard to everything appertaining to the building up and destroying of this tissue, it is our business to inform ourselves thoroughly. Upon this specialty we certainly surpass the physicians, and it is by no means an unimportant branch, and the field open for investigation and research is still large. We must know how not only to preserve the bony structure, but to improve it. The general health depends greatly on it. Who is it that has been practising dentistry any great length of time that does not know something of the complaints of women

during utero-gestation and lactation? Why, sir, it is almost impossible to keep up some women's teeth during these periods, the bony structure being peculiarly susceptible to disease at that time.

As a matter of course, the children born of this class of women must be frail and predisposed to disease. We should not be content with checking the progress of disease after full development. The height of our ambition should be to prevent disease, to watch primary symptoms and nip the evil in the bud. And as this is equally the duty of the general practitioner, why should we hesitate to give him all the information we have on the subject.

There should be harmonious action between us; the physician should call in the dentist when the disease develops or tends to develop the symptoms that belong especially to our particular branch, and we in turn should recommend the physician when our judgment suggests the necessity of general treatment.

We feel assured that we can, as said before, furnish the physician's library with works containing a vast deal of information, derived from careful and practical research upon the best means of preserving the bony structure.

The question may be asked, if we are able thus to furnish the physician with the proper information in these cases, why not apply it directly ourselves. In answer to this I would say, it is not our business to go out of our offices to look up women of frail and feeble bony structure, who are soon to become mothers, and give them the proper directions, for not only saving their own teeth, but also giving their children good ones. Not that we would refuse this kind of practice, but it comes directly in the physician's way.

It is true that all well educated physicians are aware that during child bearing and nursing there are heavy drains upon the bony system—that in many instances the raising of a few children is enough to render the mother toothless—and yet I see nothing done by them to remedy the evil. So too, it is very common for us to see persons, and have patients who have been under treatment for weeks and months by general practitioners for neuralgia, indigestion, general debility, and many other dis-

eases, without the slightest perceptible improvement, when a little dental information would have led to a correct diagnosis and a speedy cure. And on the other hand, how often is it the case that we have patients whose teeth seem to defy all our efforts unless we apply general treatment; and as it is not our business to practice medicine, it behooves us in such cases, to call in the regular physician and give the patient the benefit of our combined skill. We need a little more concert of action, we need to advise with each other to a much greater extent than heretofore. This separate, distinct and independent action of men engaged in the same thing is all wrong. We can certainly do more by working together. Associated effort is superior to individual exertion, however strenuous.

And in conclusion I will say, I hope the day is not far distant when we will have made such additions to the medical library as will force the general practitioner to exclaim, "well done, good and faithful brother, in future we, as equals, are to labour as one man for the good of the human family.

The following volunteer essay on Hidden Dental Caries, by Dr. James S. Knapp, of New Orleans, was presented by Dr. Morgan, and read by the secretary:

HIDDEN DENTAL CARIES.

BY

JAMES S. KNAPP.

The truths contained in the following remarks must have been noticed by every thinking and observing member of this Association, and by a vast number engaged in the practice of the dental art:

I am not one of the few who believe that there are instances of internal caries, or decay progressing in the osseous structure of the teeth with no external opening commnnicating with the seat of disease; for I think the falsity of this theory is too palpable at the present day to admit of its adoption by one of much observation and practice.

I was called by a dental practitioner about seventeen years ago, inviting me to see a patient in his office, in whose mouth there was exhibited an instance of what he was pleased to determine "Internal decay," or as he further explained it, "Decay in the dentine without an opening through the enamel leading to it."

The tooth was a left lower molaris, the cusps of which were considerably worn away by mastication.

Under the surface of the rather thin body of enamel which remained, occupying the site of the anterior buccal cusp, it was evident there was progressing caries, contrary to the usual rule of decay in the more central portion of the crown.

It was probable to my mind that the darkened line across the wearing surface, under which the diseased dentine was apparent, marked the site of the external fissure leading to the decomposing structure.

The operator drilled several small holes around the margin of

the decay, so near together that they were easily connected by a fine cutting instrument where they did not already communicate, thus completely encircling the place of decay.

He then lifted out the piece of rather thin enamel covering the location of the caries, having across its disk the darkened line which each of us had noticed, but which would not, at his previous efforts, admit the point of his smallest probe.

Before bringing this piece under a glass in order more thoroughly to examine it, at a slight touch of an instrument—as if the more quickly to corroborate the more generally accepted theory, though contrary to the views of the operator who had extended to me the courtesy mentioned,—this piece, I say, at a slight touch of the instrument, was separated into two pieces, the line of division corresponding exactly to the dark line at first seen on the surface.

The dental operator, though still professing to be desirous to prove to me the correctness of his views on internal caries, was unable subsequently to show me an apt illustration of his theory.

But, by hidden caries I do not mean that which is difficult to find in locations, and under circumstances similar to the instance just mentioned; but I mean by hidden decay, the actual decomposition and disintegration of the dentine which is not revealed by ordinary vigilance and examination of the masticating organs.

There are patients exceedingly careful and anxious about their teeth, who visit their dentist from two to four times a year, expecting to take disease, if not time, by the forelock, and have all filling and other operations performed as early as the operator may deem it to be necessary.

Notwithstanding their great concern, it is not unfrequently the case that ordinary observation fails to discover and detect some places of decay. Indeed, there are instances where the closest looking by the practiced eye utterly fails to discover the disease till it has made considerable progress, while cases are numerous in which the young practitioner overlooks caries already extended to the pulp.

Sick men need not a physician to talk to them of failing health, but a tooth may be diseased "Nearly unto death" without giving

the warning of pain which generally accompanies other forms of disease, and affords evidence of its progress.

It is, therefore, eminently important for the dentist to detect disease in teeth, in the early stages if possible, and inform the unknowing but anxious patient of the insidious enemy which so often endangers the health and usefulness of the dental organs.

The sense of *seeing*, with a pair of good eyes, aided by a magnifying glass if necessary, should be called into requisition.

The *thorough* removal of salivary calculus which sometimes entirely secludes places of decay, is essential to the closest observation in looking for diseased teeth.

Wedging the teeth apart for two or three days with rubber may be useful in affording a greater facility in seeing their approximal surfaces.

Fine, delicately formed instrument points may be used to advantage as probes for the apparent fissures, as well as better to determine by *feeling* if the softening dentine and destructive process are developing near the cervical approximal portions of the teeth, where mortal vision can not alone be trusted in finding out the mischief.

The wiping and removing of the saliva from those localities, together with a good light, may also facilitate the use of the two senses just mentioned: *seeing and feeling.*

A knowledge,—gained only by strict observation, and extended experience,—of the situation and circumstances under which caries is most frequently formed, will contribute greatly under the doctrine of probabilities, to the disclosure of disease.

The places where caries is more commonly overlooked are the contiguous sides of crowded teeth—especially the bicuspids and molars.

Rapidly progressing decomposition of dentine does not give the warning of that change of color characteristic of slow decay, and is too frequently overlooked until much progress has been made.

But the grinding surfaces of molars and bicuspids, where it is not difficult to direct the vision, often present instances of decay considerably advanced and yet overlooked.

A few weeks since I operated for a lady in whose mouth I thought I could correctly tell the number of fillings necessary to be inserted; and made my estimate of the fee that would be charged accordingly.

After doing at three or four sittings what I thought her case required, and being about to pronounce her mouth finished, she remarked that a certain tooth, designating the lower right central incisor, had recently ached.

It looked sound and good on all sides; but feeling sure that there must be disease in some part of it, I explored carefully around its cervical portion till my instrument found a cavity, large for the size of the tooth, completely under the gum, on the labial side, directly in front; and not only did my instrument find the cavity, but it almost simultaneously touched the exposed pulp. In order to displace the gum which covered the seat of the disease, enabling one to reach the lower part of the cavity without causing hemorrhage, and properly to treat the exposed pulp, a delay of several days was necessary, and the patient was quite willing for this, as well as to bear the additional expense caused by the unexpected discovery.

I will state that this case was the most marked instance of deceptive and hidden decay in such a locality that I have ever yet seen.

But a few days since I was about discharging a gentleman to whom I had given several sittings, when I discovered a small fissure in the anterior part of the grinding surface of the right superior anterior biscupid.

I could neither by sight or touch detect caries elsewhere in this tooth, and *wished* to tell the patient to "let it go" for a few months. The appearance of the crevice, and my conscientiousness, however, forbade me from giving this advice, which might have proved fatal to the life and preservation of the pulp, if not to the tooth, and I determined to fill it.

First enlarging the fissure by cutting its sides, I was soon enabled to expose the dentine beneath, which I found decayed quite beyond my expectations, and somewhat beyond the comfort of the patient.

The color of the caries which was nearest the surface was very near the same as that of the healthy portion; but it became more brown and still darker as I approached the limit of the disease, which carried my cleansing operation near the pulp anterior to the middle of the tooth.

Before reaching the limit of the disease in the direction assumed at first, I traced the decay posteriorly till I was surprised to find that it had already destroyed a large portion (say one-half) of the posterior wall of the tooth, bringing me out in contact with the anterior side of the second bicuspid, which fortunately was not in the least decayed.

At two different points in this compound cavity the pulp was nearly exposed.

When the tooth was ready for filling it had necessarily been cut open deeply across its grinding surface, following the usual natural depression; and nearly all of the posterior wall was gone, connecting in this way the posterior and the masticating surfaces in one cavity as large and as deep as it could well be done without exposing the pulp.

The teeth in this mouth presented a better structure and organization than the average of teeth, the enamel being pretty well formed, and slightly tinged with yellow.

As a general rule I do not advise trying to tell the patients the exact number of fillings that will be necessary to be inserted.

From my experience I am satisfied there is much decay that is overlooked, and I believe if the truth were known, there are instances in which the best, most reliable and vigilant dental operators fail to discover decay until it is much advanced.

This should not deter us as practitioners of an important branch of the "healing art," and as men interested in dental science, and desiring to render the greatest good to our patients, from using all reasonable and suitable means in aiding us to discover and arrest diseased dentine in its incipient and in its more advanced stages, whether it be *easy* or *difficult* to determine its *location* and its *progress*.

REPORT OF THE COMMITTEE

ON

DENTAL LITERATURE.

M. S. DEAN, CHAIRMAN.

MR. PRESIDENT:—Your Committee on Dental Literature beg leave to submit the following imperfect report.

Since the last report made to this Association there have been, strictly speaking, no new books, unless it be that of "Arthur on the Decay of the Teeth," added to our dental literature.

The third edition of Harris's Dictionary of Dental Surgery," the second edition of "Taft's Operative Dentistry," and "Watt's Chemical Essays," however, have been recently published and will be noticed by your committee.

Our periodical literature has been increased by the addition of the "American Journal of Dental Science," and "The Canada Journal of Dental Science." A copy of the latter they have been unable to procure, but the former will be mentioned in its proper place.

Without further preliminaries your committee will proceed to a cursory view of the works and Journals above named.

A little volume by Robert Arthur, M. D., D. D. S., evidently prepared for the general reader, was published last year by John Murphy & Co., Baltimore.

This book, for its somewhat peculiar and antiquated doctrines is entitled to a review from your committee, but it escaped their notice, until it was too late to fully examine even this miniature work, and they will simply glance at its most prominent feature.

In the third chapter, on "Treatment of the Decay of the Teeth," the author advocates the removal of the affected parts of the teeth where they come in contact with each other "to such

an extent," to use his words, "that they cannot again come in contact."

The following sentence is taken verbatim from his book: "He advises, and does not hesitate to put in practice what he advises, the separation of all the teeth, back of the eye-teeth, if the incisors are decayed before the twelfth year." Again he says: "If there is a reasonable certainty that all the teeth, back of the incisors, will decay, is it not wise to separate them *before* the decay occurs, as the object is then effected with less loss of substance of the teeth?"

These are the peculiar doctrines alluded to, and which your committee regret, that for the want of time they must pass without further notice.

The second edition of a "Practical Treatise on Operative Dentistry," by J. Taft, Professor of operative dentistry and dental hygiene, in the Ohio College of Dental Surgery, and now President of the American Dental Association, made its appearance a few months since, and should receive that cordial welcome from the profession which it justly deserves.

Its external aspect differs but little from that of the first edition; the paper, print, plates, binding, &c., being all that the reader could desire. As the first edition has been in the hands of the profession some nine years, an *extended* review, at this time, might be deemed unnecessary; but as there have been many important changes in the *features* of this work, as well as the addition of some fifty pages of new matter, your committee consider it too important an accession to dental literature to be passed without a brief notice.

Although your committee consider this work *as a whole* deserving of very high commendation, they would not claim for it perfection in all its parts. For example, they find what appears to them inconsistencies in the article treated under the head of "Green Tartar," to which, at the risk of being thought hypercritical they will briefly allude. The author says, "it (green tartar) is a thin film, barely sufficient to stain the surface, yet it enters the tooth substance and cannot be removed without detaching some portion of the tooth with it, and *unlike* salivary calculus, is

highly promotive of decay." Here the author evidently does not mean what his language indicates; that this flinty film "is highly promotive of decay," for he says in another place that "this precipitate is entirely innocent." If this film is entirely innocent of harm, and if the surface of the teeth is *not* eroded, might not the young practitioner reasonably conclude that it is a covering provided by nature, to shield and protect the teeth from threatened danger, and that the removal of this would only expose a fresh portion of the enamel to the action of corrodents,—as the polishing of a plate of copper facilitates its union with mercury? Even this article, taken together, would not probably lead te error in practice, yet it seems to be an exception to the author's usually clear style of writing.

In the first chapters of this treatise the *subject-matter* is but slightly different from that of the old edition. The changes noticed here are mostly verbal. Sometimes, however, a sentence or clause is added to express the author's meaning more fully, and frequently a word or phrase is dropped and more expressive or more elegant ones substituted. Indeed, there is scarcely a page or paragraph but shows the careful retouching of the author' pen.

These changes, in the opinion of your committee, add much to the value of this edition. For, however clear an author's views may be, if his language is vague and indefinite, he is as apt to convey a false as a true impression to the mind of the learner, and although elegance of style and diction are but secondary considerations, terseness and a logical form of expression are indispensable attributes to a treatise upon any science or art.

In their opinion, *one* of the chief excellencies of this work consists in the clearness with which the author generally treats his subjects. Any branch which he undertakes is pursued systematically to the end.

His ideas are not concealed in far-fetched and mystifying terms; nor kept in the background, while the writer indulges in fanciful preliminary skirmishes. No time is lost in entering upon his work. And while his views are usually positive and reliable, he has been fortunate in communicating them in simple, forcible language that cannot fail to be easily understood.

In short, this is an eminently practical treatise, with a few exceptions, on Operative Dentistry, abounding in plates illustrative of the various instruments and appliances now in use in this branch of dentistry, and comes well up to the improvements of the day.

It is true the author has not given all the information that we might have expected on the subjects of Dental Periostitis and Alveolar Abscess, and has omitted that of *Correcting Irregularities* altogether. This last he undoubtedly considers as more properly belonging to the mechanical branch of our profession.

In the opinion of your committee, however, as has been suggested by some of the dental journals, this subject may legitimately claim a place in a work of this kind: For although the appliances employed may be constructed in most cases by the mechanical workman, the design, adjustment and management of the case belong exclusively to the head and hand of the operative dentist. For this reason, and from the fact that our literature is somewhat deficient on this subject, we should have been glad to have found orthodontia embraced in the contents of this edition.

Besides the many alterations in the *text* of the old edition and the supply of such new matter as was requisite to keep pace with the rapid improvements in the profession, the author has added a somewhat unsatisfactory article on dental periostitis.

It is to be regretted that he confined himself to the consideration of the principles involved (to use his words) rather than the details for special cases. And it is to be hoped that *his* pen or that of some other distinguished author, may soon give to the profession what it so much needs, a treatise on dental periostitis and alveolar abscess, which enters more thoroughly upon the minute details which relate to the treatment of these diseases. But your committee would not trespass upon the time of the Association nor transcend their duties by attempting to give a summary of the contents of this work; a work, which though wanting in some of its parts, yet in their opinion possesses higher merit than any other of its kind extant, and which reflects honor upon its profession as well as its highly respected author.

The third edition of "Harris' Dictionary of Dental Surgery," carefully revised and enlarged, by Ferdinand J. S. Gorgas, M. D., D. D. S., Professor of dental surgery in the Baltimore College, and Vice President of the association of colleges of dentistry, was published some time during the past year, by Lindsay & Blakiston, Philadelphia.

As dentistry claims to be the offspring of medicine, this relationship renders a knowledge of the terminology of both of great importance, if not indispensable, to the writer and speaker on dental science. It is also as necessary (or nearly so) to the reader and hearer. For these reasons, this work, embracing medical and dental terminology and that of the collateral sciences, should be possessed by every student and practitioner of dentistry.

It is, as far as your committee are able to judge, a vast improvement upon the former editions, containing as the author states "between two and three thousand *new* words, besides additions and corrections made to the definitions of many others." Much matter has also been expunged that was found to be obsolete or useless.

This work seems to partake as much of the character of an encyclopedia of dental science and art, as of a dictionary of their technical terms; it embraces, however, all (or nearly all) the words, phrases and technicalities which belong, or relate to our specialty, and what is highly important to a clear definition, the etymology of these is usually given. If the words had been divided syllabically, their pronunciation would have been less difficult perhaps to some, but as the accented syllable is denoted, we apprehend the dental student of ordinary schooling, will experience little if any trouble in pronouncing them correctly. This work, however, is not entirely free from defects. Indeed it will always be impossible to bring a work of this kind very near perfection, while the science and art are running before it at the present rapid rate. A dictionary embracing and correctly defining all their terms can never fairly overtake them.

Though your committee are frank to acknowledge their incompetency to prepare a just criticism on a work of this character,

they would direct attention to a few of its short-comings which they have noticed, viz:

The word *root* is defined *only* in its botanical sense, while *fang* is defined as the *root* of a tooth. Here the first definition is deficient, and the last incorrect. Although the word *fang* is still used by a few of our learned speakers and writers, others equally as learned consider its use in this sense wholly unauthorized by its original signification, and have discarded it from their vocabulary. In Taft's new edition on operative dentistry this word has been almost invariably expunged and *root* substituted in its place. And as for ourselves, we can see no possible reason for using this term in a sense so incompatible with its primary signification, except that it has received the sanction of some venerable and reputable authors; and so have other errors equally venerable, but when discovered little respect has been paid to their age; they have been unceremoniously driven from our literature; and so it is to be hoped this word *fang* used as the synonym of *root* will be tabooed by our authors and teachers and rejected by our dental lexicographers.

But these are minor faults and your committee are able to find but few even of these. The synonyms of words, though generally, are not always given. As a case of omission, under the head of "*Irregularities of the Teeth*," the technical term, Orthodontia, which we should have expected to find, is not given. But such exceptions are contrary to the general rule and seldom to be found.

In closing the imperfect notice of this edition, your committee would cordially recommend it as a comprehensive, satisfactory and desirable lexicon, in which may be found nearly every term that legitimately belongs to the nomenclature or relates to our science.

A collection of "Chemical Essays in reference to Dental Surgery," by George Watt, published by S. S. White, Philadelphia, is the title of a little volume which manifests considerable taste on the part of the publisher, and justly reflects honor upon its author.

It is printed on fine, tinted paper, and the impression is clear and neat.

Although these essays have been published before, in a disconnected form, yet very many of the profession who have read them as they made their appearance from time to time, will be glad to find them gathered into a single volume. And those who have never seen them, have reason to thank the author for presenting them in so beautiful and convenient a form for their perusal and study.

As the man who buys a horse, frequently finds a *halter* "*thrown in*," so the dentist who secures a volume of these "Chemical Essays," will find essays on other subjects included; the most of which, however, contain valuable information given in that piquant, racy style which generally characterizes the writings of that author.

Although this work is not intended as a *text-book*, it should be found in the hand of every dental student, and may be studied either at the beginning or close of his professional education. If taken at the commencement of his study of this branch of science, before he acquires the necessary courage to grapple with the dry formulas of a more extensive treatise, he will find himself irresistibly drawn within its portals, and instead of the dreaded obstacles which he expected to encounter, he finds a paradise of unrivalled beauty which he becomes eager to explore.

He is graciously introduced to Lord Oxygen and his lady, and is so charmed with their wonderful and versatile characters that he is anxious to become more thoroughly acquainted with them, and resolves to cultivate an intimacy, not only with them, but with each and every one of the more distant relatives; and as far as the scope of these essays will permit, his curiosity is gratified to its fullest extent. His preconceived notions in regard to the *dryness* of the subject, the result of the union of the two first elements treated (oxygen and hydrogen) will suddenly and forever dispel.

But if these essays are taken by the student at the close of his pupilage, after he has become somewhat familiar with dental chemistry, he will find in them new ideas so quaintly and forcibly expressed, and clearly illustrated, that they will become indelibly

fixed in his mind, and ever ready when their principles are required in his practice.

Still these essays are by no means the exclusive property of the dental student. The practitioner cannot fail to read them with pleasure and profit, be he old or be he young in his profession; with *pleasure*, for it is to be hoped there is no one in our profession, so utterly destitute of those finer sentiments that exalt *the man* above the level of a *living machine*, that he will not be thrilled with delight as he reads the essays on Lord Oxygen and Lady Hydrogen. In these particularly the writer shows a true poetical spirit; and treats his subjects in the most animated nature imaginable. His fancy, which is everywhere so vigorous, here revels to its fullest extent, enlivening his subject with personification and figures. Yet this author, in his highest flights does not leave his subject trailing in the mud below, like the too heavy tail of a kite; but carries it along with him and exhibits it clearly and truthfully (as well as fancifully) in the bright sunlight of science. And if he does occasionally avail himself of the privilege of that "*license*" in some of his essays to which he is justly entitled, he is, when the principles of his favorite science are involved, scrupulously and mathematically exact.

Your committee confess a lack of time and ability to enter fully upon a review of this work; and if it were otherwise, it might not be considered as properly coming under the head of their duties at this time. Whatever they have said in regard to this production, if not wisely, was spoken conscientiously. They would not be understood, however, as claiming perfection for all that is contained in this volume; but, that it possesses uncommon literary and scientific merit, the learned and unlearned reader cannot fail to discover.

Since the last report made to this Association your committee believe that there has been an improvement—though perhaps not a very marked one, in our periodical literature. The "Dental Cosmos," "Dental Register" and "Dental Times," are ably conducted and have *chiefly* represented our periodical literature for several years past. These journals have already been noticed by

former committees and are doubtless familiar and regular visitors to the members of this Association—if not, they should be.

The "American Journal of Dental Science," which had lain in a state of asphyxia for many years, dead to the profession, was in May, 1867, resuscitated by A. Snowden Piggott, A. M., M. D., and F. J. S. Gorgas, M. D., D. D. S., and has again appeared in all its pristine beauty and vigor, to rejoice the hearts of its old friends, and make new ones of all who may court its acquaintance. It is published monthly by Snowden & Cowman, Baltimore, and contains about 52 pages of reading matter. Its appearance and dress are unexceptionable, and its literary merits entitle it to a high rank among our dental journals. Many of its articles are from the pens of learned, scientific and practical dentists and contain much valuable information. Yet in the opinion of your committee, its value would be greatly enhanced, if much that is but remotely allied to our specialty could be displaced by articles of a more strictly practical nature.

These remarks are not applicable to the "American Journal" alone, but to all our dental periodicals.

Not that your committee would deem it wise on the part of the dental journalists, or beneficial or desirable to the profession, to circumscribe the scope of these journals within too narrow limits; for articles on Chemistry, Physiology, Pathology, Microscopy and Anatomy, if they go beyond the published standard works on these subjects, or have a relative bearing upon our specialty are as legitimately entitled to a place in the columns of these, as are the details in the practice of dental surgery.

Again, in all our dental journals there may be found articles of interest to our profession, displaying considerable research on the part of the writers, which at the same time show reprehensible carelessness in their preparation for publication, and then again, a writer occasionally expends his force on his composition and in impressing upon the minds of his readers the importance of the subject that he is *about* to treat, but which ever coquettishly eludes his grasp. The former class of writers while they annoy, instruct: the latter only annoy and disappoint the reader.

In the present advanced stage of our specialty, the profession

are less satisfied than ever with their attainments in practice. No improvement in the art astonishes, nor discovery in the science startles or satisfies them. They still feel a longing after something that lies yet farther beyond their reach and which they eagerly look for in the dental journals. Nor are they wholly disappointed.

For these are the *avant-couriers* that herald each advancing step taken by our art and science.

It is an easier matter to discover faults in these journals—for they have faults—than to remedy them.

In the opinion of your committee the surest and most effectual remedy for the evils that exist in these journals, *is a more liberal pecuniary support.* This remedy, it is to be hoped will be vigorously and "heroically" applied by every member of the profession.

Before closing this report your committee would barely refer to the printed "Transactions of the American Dental Association," for *these* constitute too important a branch of our dental literature to be passed without mention.

In its *discussions* may be found (among the chaff) much that would be creditable as emanating from any scientific body of men, while the *essays*, many of them, have been carefully prepared by the ablest writers in our profession, at home or abroad.

In conclusion your committee confess they are not blind to the imperfections and short-comings of this report, and they only hope the Association may kindly view its faults through a *concave* rather than convex medium.

Dr. Atkinson:—I wish to make a few remarks in reference to the report just read. There are omissions in the report which ought not to have occurred in it. The glaring defect in this report is the entire omission (and the fact gives me pain to notice) of the *Chemical Dental Journal.* Now, the babe must be kissed when it is born, and loved and nourished if you expect it to attain maturity, and although it may not have all the hardness and stability which it will have when it is twenty-one years old,

it nevertheless must be recognized, and I wish to recognize this visitor of ours on the other side of the lake.

The President stated that "Dental Histology and Microscopy" was now in order, and called for the report of the committee.

REPORT OF THE COMMITTEE

ON

MICROSCOPY OF THE TEETH.

BY S. P. CUTLER.

Being on the committee of Microscopy for the Niagara meeting of the American Convention, August, 1868, the following paper is respectfully submitted.

In this article I propose to review the hitherto leading publications on the above named subject:

Tomes' Dental Surgery, edition 1859, American, page 286-7, first speaks of germination of connate teeth, both enamel, cementum, and dentine by a union of those respective structures.

Page 319, Mr. Huxley's membrane pre-formative can be separated during its growth by acids situated between the enamel pulp and the enamel, its functions not fully determined. Before its discovery it was thought the enamel was formed by the calcification of the enamel pulp.

Page 315, Mr. Nasmyth first discovered the membrane. It is only after some months or years that the enamel is completely hardened, though fully formed before eruption.

It is not known at what period this hardening is fully completed. Probably there is a difference in different temperaments and constitutions.

Same page, Mr. Huxley thinks the enamel membrane continuous with the cementum, and may be found in the deep depressions in crowns of teeth, molars, containing lacunæ. Same page, thinks the absence of lacunæ in the thin portions owing to want of thickness.

Dentine: page 322-3, says the tubes take a radiate course from the central axis formed by the pulp cavity towards the surface of the tooth in the crown, and to some extent in the fang.

Says, besides in addition to numerous secondary minute undulations, the tubes describe several bold curves resembling the italic letter *f*. *He has not described the accurate* position of these curves, nor stated at what angle they leave the cavity, nor what course they assume, but would lead any one to suppose that they pass directly to the surface in the shortest manner, instead of obliquely up towards the cutting or grinding surface throughout the whole course of the tooth, which has already been accurately described *by myself in a former article.* Same page, Tomes says the dentinal tubes by the anastomosis of their branches become connected with each other, and also establish relations with external dentinal tissues. Says in the crowns of the teeth they terminate by forming loops, and become to be traced or pass into the enamel and there lost. *I have never seen these* loops in the crowns; only in the neck and fang, and not in *every case there.*

Page 323, he says in the neck and root of the tooth the branches of the tubes anastomose freely and are lost near the surface of the tissue near the neck; they stop short of the cementum.

(*The tubuli of the neck nearly all reach the* enamel, and those of the upper fang reach the neck, and it is true these branches are so fine they are not easily traced; still from the extreme sensibility of the neck where exposed, in many cases it is reasonable to infer that they come to the surface *with their sensitive nerves.*)

Same page, says towards the end of the root they commonly pass into the lacunæ.

(*I agree with him*).

Page 324, Kölliker states in respect to contents of tubes during

life contain a clear fluid and cannot be readily detected in recent preparations. *These views* have received general credence in the profession both in this country and Europe.

(*I have ignored this* fluid doctrine, and instead assign to the tubules true nerve fibres which are continuous with those of the soft pulp, and have, I think, deduced satisfactory proof *in my former articles.*)

Page 327, Tomes says that each tube is permanently tenanted by a soft fibre which follows its ramifications, and goes on to show how this may be demonstrated. He does not claim that they are nerve fibrils. Mr. DeMorgan made researches in this direction. Same page, Tomes says the manner in which the dentinal fibrils terminate in the pulp I am unable to say; says in favorable specimens they may be traced a short distance into the pulp, but whether they are terminated by cells, or in any way connect with nerves, I am unable to determine.

(In a former communication I have given the microscopic appearance of the entire pulp, and the fibrimental connection throughout the dentine.)

Page 333, he holds out the idea that the fibrils are the cause of sensibility; then, on same page, says it is by no means necessary to assume the dentinal fibrils are actual nerve fibre, before allowing them the power of communicating sensation. Then goes on to prove that they are not nerves. Says many animals are endowed with sensation which yet possess no demonstrable nervous system; and farther says, we may find many points in the human system highly sensitive without our being able to demonstrate the presence of nerves in such numbers as would account for the pain uniformly experienced from the puncture of a needle, upon the supposition that in each case the needle had wounded a nerve. (Now in the parallel drawn there is not much logic or argument):

As one assumed negative is attempted to be established by another assumed negative, he does not reason from positive data. The skin is highly endowed with sentient nerves as well as all serous surfaces, and motor nutrient nerves in all mucous surfaces. (Right here I maintain that any nerve sup-

plying any tissue gives nutrition to the tissue so supplied, whether special functions or general motor and sentient. This is not, however, the generally received opinion.)

Page 334, Tomes says fluids may pass through the tubes even if they contain a soft fibril and give nutrition and return waste material, and that tubular ossification may be caused from the same process. (In so far I agree with him, and maintain that there is space enough around the fibril in the tubules to admit of osmotic action both of nutrition and waste, and ossification of tubuli whenever it takes place.)

Mr. Lent maintains that the tubes divide and then anastomose together.

Page 380, Mr. Salter speaks of the calcification of the pulp when it occurs upon the surface, producing new dentine continuous with the older tissue as extrinsic calcification, and the nerve tissue as dentine of repair. Nodules in the pulp cells intrinsic calcification. Speaks of the former as a reparative process and the latter as disease. His descriptions are good, so far as they go, but by no means accurate in their details.

On page 32-3, are drawings representing the tubuli as anastomosing extensively sometimes, and unite and form one and continue a short distance, then again divide. This I have seen in fangs only.

Page 34, speaks of striæ transverse to tubuli, and assigns as their cause the irregular dilatations of tubuli. Says they exist in alternate tubuli. (This last fact has not come under my own observation.)

Page 36, says it is not uncommon for primary tubes, previous to any branching, to dilate, receive branches from other primary tubes into the dilatation, and again contract and assume their original course. (This I have never seen only in the fangs, and not as a common occurrence by any means there.)

Page 37, says in the fangs the anastomosis is more frequent and general than in the crowns. (I have never seen this in crowns and seldom in fangs, only in certain teeth.)

Page 36, see the views and labors of Leeuwenhoek, Purkinje, Retzius, and page 67, of Nasmyth, Owen. All these were mak-

ing researches about the same time—about 1836–7—when dental anatomy began to assume a histological character from the colabors of the above named authors, since which time the labors of others have contributed to the advancement of this department of science.

In Tomes' paper presented to the Royal Society by Thomas Bell, Esq., June 21, 1838, he speaks of the vascularity of dentinal tubuli.

Same year, Nasmyth published a work on the teeth, giving Retzius' views.

I have given the leading points of the above authors' discoveries in dental microscopic anatomy.

Lehman's Physiological Chemistry, vol. 2, page 202, speaking of the teeth, says: "We do not observe bone corpuscles or other structures peculiar to bone in the dentine, but in their place we have interglobular spaces of Czermack, which resemble holes made by bullets."

Burzelius, Lassaigne, and Von Bibra have thrown the greatest amount of chemical light on the teeth.

Virchow's *Cellular Pathology or Histology*, American edition, 1858, on pages 115–16, says vessels are found nowhere but in the pulp cavity, in proceeding from which outwards we find nothing but the proper substance of the tooth (dentine), with its system of tubes which extend nearly up to the surface and in the root, directly continuous with a layer of real bony substance (cement).

Here Virchow regards the cement as true bone. Here I differ with him; as the cement on an exposed fang of a living tooth, may become exceedingly quick to the touch of the finger nail or any instrument; not so with the surface of any bone where there is no periosteum.

He further says a provision for the conveyance of nutrition similar to that of bone from the marrow takes place from the pulp through the tubes; speaks of tubes in teeth and bones in conjunction and as identical. He says nothing of the dentinal filaments or any other peculiarity respecting the teeth other than that of bones.

Prof. Spaulding thinks the nerve of the pulp branches and stops near the surface, does not know whether in loops or points, but rather inclines to the latter; thinks the pulp membrane is in some way fastened to the pulp dentine; does not say how he has adopted the fluid theory; says also dentine is structureless.

Handy's Anatomy, page 240, ed. 1854, speaking of a tooth taken from a drawing in *Harris' Dental Surgery*, says Professor H. is confident the dentine contains blood vessels; says on examining the specimen with a microscope a number of vessels were seen in the ivory substance of the bone charged with blood. Here we find these eminent American authors entertained at that time the idea of vascular dentine. There may be anomalies where vascular dentine may be found, though I have never seen it.

Page 239, Mr. Nasmyth says the structure of the dentine is like that of the pulp, consisting of cells and fibres.

Page 240: The beads represent the nuclei of the different cells, which consist of animal tissue, remain as such, and, connected in a linear series, constitute the fibres of the ivory, while around the fibres, and within the cells is deposited the calcareous matter, giving hardness, density, and strength to the ivory; says the fibres themselves are found to be solid instead of tubular, as Retzius thought, and the interfibrous substance, instead of being structureless, to consist of organized cells.

What do we gather here from Mr. Nasmyth's views? He does not seem to fully understand even what he has written, or, at all events, fails to make them clear to his readers. He admits the presence of something in the tubuli, but does not define their character, only that they are fibres; does not assign their presence to any particular object or use in these organs.

Owen's Odontography, ed. 1845, page 458, vol. 1, says: After the pulp cavity has been reduced by the completion of the dentine, it is further diminished by the conversion of a part of the residuary pulp into a layer of osseous dentine. The cement which is thickest at the end of the fangs sometimes penetrates the pulp cavity, and, blending with the osseous dentine, closes the aperture, except where two or more minute canals perforate it for the passage of capillary blood vessels and nerve filaments.

Just here I differ with the author. Instead of capillary blood vessels we have both arteries and veins, and capillaries throughout the pulp and the dentinal nerve proper entering the formation and nerve filaments through the pulp, which have been accurately described by myself in a former article.

The cement spoken of as entering and lining the interior of the pulp cavity at any point, as a general thing is not the fact.

Page 460, speaks of contour lines and course of tnbules, not differing essentially from other authors already quoted.

Same page, speaks of the lateral tubuli sending off lateral branches into the intertubular spaces and there being lost, or forming anastomoses.

This may be seen in the fangs of certain teeth, but not in the crowns.

Page 463, says the dentinal cells are 1-30,000 of an inch, and the enamel fibres 1-5,000 of an inch, and the cross-lines 1-2,000 of an inch, cement cells 1-2,000 of an inch, arranged in concentric layers.

Owen differs with almost all of the other authors in relation to size of tubuli; facts do not justify his conclusions.

He speaks of tubular fibres but does not speak of them as nerve fibres.

Although he bases his system of comparative anatomy on the physical structure of teeth he does not make the dental microscopic anatomy a specialty, neither is that essential to his purpose.

Kölliker, who has done more and gone farther into microscopic anatomy than any other man, seems to have accomplished less in the dental tissues than any other tissue of the body. This is owing to the fact that like all the other general observers he has not made the dental tissues a speciality. Not even Tomes has paid as much attention to the microscopy of the teeth as he should have done.

The dental profession above all others, should at least take the foreground in both descriptive and microscopic anatomy of the teeth.

Peaslee's Histology, Ed. 1857, P. 369, says the tubuli average

1-10,000 of an inch at their pulp origin. Again says, they are naturally filled with a clear fluid for the nourishment of the tooth, which does not contain salts of lime as is sometimes stated. Speaks of the curvature of tubuli. Page 370, Retzius says the smallest tubuli measure 1-60,000 of an inch in diameter.

Also on the same page he speaks of interglobular spaces as being filled by a soft substance like bone cartilage, osteine, and has a canaliculated structure like the dentine itself.

In the above quotations (with comments) I have given all worth relating concerning the microscopy of the teeth, of the various authors named, which leave anything but satisfactory conclusions in the minds of the intelligent portion of the dental profession. Many points are left obscure with contrariety of opinions and none of them giving complete satisfaction to the earnest enquirer after such knowledge. The field of microscopic science is boundless, vast realms are yet unexplored, the environs scarcely having been entered; ages may roll by and then the science will scarcely more than have begun. While the telescope looks out upon the mighty and vast universe and scans the great vault of endless extent, the macrocosm, the microscope looks down into the infinity of infinitesimalism, the microcosmical universe, revealing the minute structures of the inorganic and organic world, without the aid of which no accurate knowledge could ever have been attained. No conceptions of organic creation in its fundamental structures could have been had without microscopic aid. Histological science has its origin in microscopic developments ; Physiology and pathology are undergoing mighty revolutions by its aid. The text-books of a few years back are replaced by modern advancements of those sciences by microscopic aid. Still farther advancements may be anticipated.

The microscope in my own hands has contributed to the conviction and sentence of two burglars, by determining the character of blood supposed to be human which was proven to be chicken blood. Hence the importance of the microscope in forensic medicine or jurisprudence.

Very recently the microscope in my own hands perhaps decided the fate of a human being in surgical diagnosis. Some four

weeks since the amputation of a young man's thigh having become indispensable to save life, the entire faculty of this place had decided on the malignant or cancerous nature of a tumor situated on the anterior part of the leg, just below the knee. The patient having suffered some seventeen months and being very much reduced, it was thought to be useless to perform the operation. On application being made to me, I submitted some of the secretions to the microscope, which gave not cancer or other malignant cells, and in consequence the operation was performed, and so far the recovery has been most favorable and rapid, and no indications whatever of any return of the disease, with union by first intention of the integuments. The benefits of the instrument to humanity can scarcely be conceived of. More true knowledge of organic science has been derived from the microscope than from any one department except chemistry, not being in fact far behind that.

Dr. McQuillen gave a description of a visit to the Army Medical Museum at Washington, having passed the greater part of a day and evening in examining the resources of the museum, and the achievements of Drs. Woodward and Curtis in micro-photography. Dr. Woodward had demonstrated to him most conclusively that with a one-eighth objective of Wales, amplified by the introduction of an achromatic concave lens (made by Tolles) at the bottom of the draw tube, and an ordinary eye-piece, the same results could be attained as with a fiftieth of Powell & Leland, which, in view of the delicacy of these lenses, and their costliness (the one-eighth costing $65, while the fiftieth cost over $300), was a consideration of very great importance. An exhibition of the micro-photographs, in the evening, with the ordinary magic lantern, illuminated by the calcium light, had afforded him much satisfaction, on account of the clearness and sharpness of outline of the objects thrown on the screen, proving much more serviceable for the demonstration of animal structures before a class of students than the gas microscope. He presented these observations, hoping that those who are to teach in the various dental colleges, during the coming winter, will avail

themselves of every possible means for presenting microscopical knowledge to their classes.

Dr. Shepard, chairman of publishing committee for the years 1865 and 1866, made the following report:

Mr. President and Gentlemen of the American Dental Association: Your publication committee, appointed at Boston in 1866, have completed their labors, and present their report:

We have printed an edition of 500 copies, embodying the transactions of 1865 and 1866, in one volume, making a book of 511 pages.

Most of the proof-sheets have been revised by their authors, and thus we claim that we have avoided a great part of the errors liable to occur in books of this description. We have endeavored to produce a book which, in regard to typography, paper, and binding, should be worthy of the Association, and compare favorably with the publications of similar societies.

The actual cost of each copy is $2.22-100.

The Committee hope that the general appearance and accuracy of the work will partially excuse the Committee for their long delay.

We would recommend, to secure a large field of usefulness for our publications, that copies be presented to the Boston Society of Natural History; Chicago Academy of Natural History; Philadelphia Academy of Natural Science; Odontological Society of London; respectable dental journals, American and foreign; *American Journal of Medical Science; London Lancet:* British and Foreign Medico-Chirurgical Society; *Boston Medical and Surgical Journal; Medical and Surgical Journal*, of Philadelphia; and to Dental Colleges.

We name these societies and journals as they are prominent ones.

PUBLICATION COMMITTEE OF 1866,

In Account with the American Dental Association. *Dr.*

To cash received of Treasurer	$610 94
" " " from sales	60 00
" " " from back dues	15 00
	$685 94

Cr.

By amount paid for publishing transactions for 1865 and 1866	$1,110 66
" advertising	10 00
" paid freight, &c	10 10
" " postage, &c	18 72
" " miscellaneous expenses	25 00
	$1,174 48
Balance due Committee	488 54

Respectfully submitted.

L. D. SHEPARD,
T. B. HITCHCOCK, } *Committee.*
JAS. McMANUS,

On motion, the report was accepted.

On motion of Dr. Atkinson,

Resolved, That a special auditing committee be appointed to examine into the report, of which the chairman shall be the Treasurer, Dr. Goddard.

Committee—Drs. W. H. Goddard, W. H. Morgan, W. H. Atkinson.

On motion of Dr. Horne, a vote of thanks was extended to the Publishing Committee for the satisfactory manner in which they had discharged their duties.

Dr. McQuillen would take occasion to say that Dr. Allen has a very fine section, showing the interglobular spaces, eolored with carmine, under the microscope, and he would like the members to view the specimen.

Dr. Allen—The specimen that I have is a red preparation. Dr. Cutler thinks that those who prepare the specimen make the interglobular spaces, but I would say that I soaked this specimen, after I had made the section, for a week perhaps, in a solution of glycerine, stained with carmine, and then soaked that in

clean glycerine, and afterwards cleaned the surface perfectly and mounted it in Canada balsam, when I should have mounted it in clean glycerine; but the result has been that those cavities are not put there, and I think Prof. Cutler will have difficulty in washing them out. These specimens have something of a historic value, as one was shown before Prof. McQuillen's lecture, the other is a permanent tooth, apparently perfect—an adult tooth, and this has never before been shown, except to members of the New York and Brooklyn Societies, and therefore, being shown there and here, and the request being made by Prof. Cutler to accept from him a specimen corroborative of the theory that he advocates, concerning the connection of the contents of the tubuli with the dental pulp, it will make this exchange a matter between the Society and Prof. Cutler. What we want is to get at the truth. I hope and desire that Prof. Cutler may send to us a section of the external membrane of the pulp, showing the points of the departure of these nerve filaments, which he says pass into the tubuli. He says he has such preparations, and if we can get anything of that kind, I will show it to you next year.

On motion of Dr. C. E. Latimer,

Resolved, That the members of this Association who may wish to report cases, or present their views upon the subjects discussed, and have not an opportunity to do so pending the discussion, be permitted to present their cases and opinions, concisely, in writing, to the Publishing Committee, to be incorporated in the published proceedings, provided that Committee deem them worthy.

Adopted.

Dr. Atkinson—I very much regret that so much time has already been consumed, when the probabilities are that we will have to adjourn pretty soon, and yet leave so much of the discussion untouched. We are here in the midst of differences of words more than in differences of comprehension. I think that we are more at fault in the communication of our ideas, than in the ideas themselves. The definition of nerve seems to be the particular sticking point. I have tried before to make myself

heard in this direction, and to remove the difficulties in the way of sensitive dentine. Every histologist knows that the tubules are but uncalcified tracks in connection with the pulp, that produces the dentine by the calcification of a certain part of these cells that are denominated dentinal cells. There is a difference of opinion with regard to the point of calcification of these cells, whether it be in their interior, or in the periphery. Later observations in Europe that have been recorded state that the calcific action took place within the center of the cell, and that when this substance that holds the lime salts in solution had been rendered too poor to afford lime salts to make the equivalency, so as to connect the calcified points into a mass, then a track was left between the points of conjunction of the cells. These are arranged in a line from without towards the pulp, the calcific action beginning at the extremity of the pulp, which would be a perfectly solid piece of calciferous matter, provided the solutions of lime were sufficiently strong to induce this condition. This is easy of proof to any one who has looked at the section of a tooth.

In its normal condition, the sensitiveness of the pulp is but little, if the person be in a fine physiological condition, and is a well organized individual. You cannot get healthy dentine except in well organized individuals, but let them become acidified and they will become sensitive, and why? because this has a tendency to reduce it to the condition that I denominated yesterday as being a "similarity of irritancy."

Suppose this be explained by an excess of carbon, then we have the normal condition. Take the acidifying agents, hydrogen and oxygen, and we have made the first step towards pathological activity by inducing supersensitiveness. If we will but apply our minds closely, so that the tension of mental effort shall not be broken, it is just as easy to understand this as mathematics, and until we do understand it in this way, (which is the only process by which we can become acquainted with the movements of living bodies,) we shall utterly fail to be of benefit to each other, and we must benefit or injure each other at each and every contact in life.

On motion of Dr. Kennicott,

Resolved: That the suggestion of the committee on publication for 1866, concerning the presentation of the published transactions to certain societies, journals, &c., be adopted.

On motion of Dr. Allport, the time of final adjournment was fixed at 6 ½ o'clock, this P. M.

It was moved and seconded that the session be continued ten minutes, to allow Dr. Judd to make some remarks upon the subject last discussed. Adopted.

Dr. Judd:—I have but a very few remarks to make on this subject, and ten minutes will be ample time for me. In the first place, I wish to make the statement that I have confidence in the published experiments of Cohnheim in relation to the formation of pus. I have this confidence for this reason, and that is, because he has detailed every particular step in relation to the experiments by which he arrived at his conclusions. I make this statement in order that I may further state, that by the common consent of all microscopic observers of the present day, it is a rule that he who declares anything new as the result of his investigations, is bound to give to the profession so many of the particulars of his observations, that other observers may repeat them, and if this is not done, they will not be recognized as established. I wish to make that point clear. I say that it is acknowledged to be essential, by all observers of the present day, that whoever puts forth a new doctrine, must put forth the methods by which he arrived at his conclusions, so clearly that others may make the same investigations, and either verify or disapprove them. Now, for a gentleman to come up and say, "I have seen this thing, or that thing under the microscope," and give no other details, savors of an assurance and a total disregard for the customs and usages of scientific microscopic observers, that is almost ridiculous. No credit should be given to such statements at all, but all such observations should be accompanied with sufficient explanation, so that others may repeat, and either verify or disprove them.

I have but a single word to say in relation to the contents of the dentinal tubuli. It is my opinion, Mr. President, that the

dentinal tubuli contain nerve fibres, and I desire to occupy your attention for a few moments, in telling you why I am of this opinion. Let us trace up what has been observed and given to the world by good observers, who likewise have given to the profession the methods by which they have arrived at their conclusions.

In the first place, Tomes declared that there were soft fibres in the tubuli. He demonstrated this and showed conclusively, that by separating carefully the pulp from the wall of the pulp cavity, he could draw out, to a certain extent, these fibres and show them under the microscope; and he showed, moreover, that by making a very thin section of dentine, placing it on a piece of glass under water, and separating it carefully, some of the soft fibres could be drawn out of the tubuli to a certain extent, and clearly shown. The fact is established that there is a fibrous substance that occupies the tubuli.

Now, in connection with this subject, we will take cognizance of some results attained by the observations of Beale. He calls the peripheral cells of the pulp germinal matter, as you are aware, so when I speak of the germinal matter of Beale, I speak of the peripheral cells of other authors. He showed that this germinal matter enters the tubuli, and that there is a direct connection between the pulp itself, *i. e.* the germinal matter of the pulp, and the substance contained in the dentinal tubuli, in other words, that the soft solid which occupies the cavity of the tubulus is only a prolongation of the germinal matter of the pulp.

Then he has made another observation in relation to the termination of nerves. In Beale's observations upon the termination of nerves, where others have seen what they have denominated the termination of the nerve fibres, he has declared that it is merely the breaking up of the fibre into a vast number of minute fibrillæ.

Now, he has traced the nerve fibres into the germinal matter of the pulp, and has seen them break up and ramify in this germinal matter. Now if these ultimate fibres ramify in the peripheral germinal matter of the pulp, is there any good reason to suppose that these minute fibres or fibrillæ are confined to the central mass of germinal matter, and do not extend with the processes of

the same; *i. e.* into that portion of this same germinal mass that extends into the dentinal tubuli. Now how much more does it want to complete this demonstration? It is just as near a demonstration as it is possible to make it, without the whole thing being actually seen.

If we reflect for a moment we shall be able to understand why Tomes did not feel himself warranted, with the facts that had then been elicited, to fully conclude that the nerve fibres did enter the dentinal tubuli. In the first place, the smallest nerve fibres then known were too large for the calibre of the tubuli, which would at once form an insuperable objection to that doctrine. At that time it had not even been surmised that these ultimate fibres existed. The wonderful powers of the microscope, made use of by Beale, have revealed this fact to the world, and remedied the difficulty that lay in the way of his reaching such a conclusion. But now we find that instead of these fibres presenting terminal points, at or near the periphery of the pulp, that they break up into fibrils of the one hundred-thousandth (100-1000th) part of an inch in diameter, and as the dentinal tubuli are 1-10,000 part of an inch in diameter, it is at once seen that abundant room exists for whole plexuses of such nerve fibres within these tubuli. It is upon these grounds, and for these reasons that I believe the nerve fibres themselves do enter the dentinal tubuli.

The President announced that fifteen minutes would be allowed for the transaction of miscellaneous business immediately after the convening of the Association in afternoon session.

Adjourned till 3½ P. M.

FOURTH DAY—AFTERNOON SESSION.

The President called the Association to order at 3½ o'clock.

On motion of Dr. Spelman, the following amendments to the Constitution (notice of which was given by him at the meeting of the Association in Boston in 1866) were adopted, viz:

Insert between sections 2 and 3 of Article III the following:

"To be entitled to representation in this Association, Dental

Societies shall be required to adopt or substantially recognize its code of ethics."

And insert between sections 4 and 5 of the same article the following:

"Any member of a local or state association who is expelled from the same, shall cease to be a member of this Association from the date of his expulsion."

On motion of Dr. Wetherbee,

Resolved, That $20 be furnished Dr. Abell by the Association for copies of his paper containing the transactions of this year's meeting.

The following communication was read:

"DR. J. TAFT, *President:*

"For what I deem good and sufficient reasons, I desire my connection with this Association to cease from this date.

J. A. PERKINS.

"*Niagara Falls*, July 29th, 1868."

On motion, the communication was laid on the table.

On motion of Dr. Spelman, debates on subsequent papers were limited to one hour.

On motion of Dr. French,

Resolved, That all remaining papers be read in succession, discussions to follow.

The Committee of Arrangements made the following additional report:

MR. PRESIDENT: The proprietor of the Spencer House having made no charge for the use of the room occupied for the evening session,

Resolved, That the Committee of Arrangements be empowered to pay the proprietor of the Spencer House ten dollars.

AMERICAN DENTAL ASSOCIATION,

In Account with Committee of Arrangements.

To amount paid for rent of hall	$50 00
" " " " Printing	17 50
" " " " Reporting	45 00
" " " " Miscellaneous expenses	15 00
	$127 50

Respectfully submitted.

GEO. B. SNOW,
B. T. WHITNEY,
A. P. SOUTHWICK, } *Committee.*

On motion of Dr. Wetherbee the report was accepted, and the Treasurer ordered to reimburse the Committee.

On motion of Dr. Horne, the Committee on Revision of the Constitution was instructed to place the election of officers among the last items in the order of business.

Dr. Bogue, chairman of the Committee on Revision of the Constitution, reported as follows:

MR. PRESIDENT: Your Committee, to whom was referred the Constitution and Laws of this Association for revision, hereby report the following changes which they propose at this meeting, in order that they may be acted upon in our next:

Errors. 1st. To renumber properly the articles and sections and to correct accidental and verbal errors, so that nothing may conflict with these amendments.

Erase U. S. 2d. To strike out from Article II the words "in every part of the United States," and from section 2, Article III, the words "in the Union."

3d. To substitute in Article III, section 1, for the present section the following:

Members. The members of this Association shall be of two classes, Delegates and Permanent Members, having equal rights and privileges.

To substitute for present section 2:

Delegates. All Delegates shall be practitioners of Dentistry. They shall receive their appointment only from Dental Colleges and permanently organized Dental socie-

ties, having definite conditions of membership other than pecuniary, which shall have been approved by the Executive Committee, and a copy of which shall be in the hands of the Recording Secretary of this Association.

To substitute for the present section 4:

Permanent members shall consist of all those who shall have served one year as delegates, and complied with the requirements of the Association, and who shall signify to the Treasurer a desire for permanent membership. Permanent members.

Insert a Section instead of Sec. 5

Requiring five dollars to be paid yearly by each member before he can speak or vote, and in case the dues remain unpaid at the second annual meeting thereafter, his name shall be erased from the list of members without further action. Dues $5.

To substitute for the present Section 6:

Each new member before voting or speaking on any subject before the meeting, shall sign the regulations, inscribing his name, and the title and location of the institution from which he receives his appointment. Signing Constitution.

To change the time of meeting to the first Tuesday in August. Meetings.

To change Sec. 1, Article V

So as to include the Executive Committee among the officers, and to provide for the election of all the officers by ballot without nomination; the two names, or, in case of a tie, the three names having the largest number of votes, to be the sole nominees, in case of a failure to elect on the first ballot, and a majority of all the votes cast for these names to be necessary to a choice. Officers.

To amend the wording of Sec. 2:

President shall preside according to Parliamentary usage, and the rules of order adopted by this Association. President.

Corresponding Secretary.

To erase that portion from the requirements of the Corresponding Secretary which refers to notice of time and place of meetings, and insert it in those of the Recording Secretary.

Section 5, Article V to be altered thus:

Recording Secretary.

The Recording Secretary shall keep accurate minutes of the proceedings of the Association, preserve the archives and unpublished documents, and attend to the other duties that appertain to his office.

Chairman of Publication Committee.

He shall be ex-officio chairman of the Publication Committee, and shall give due notice of the time and place of meeting of the Association.

Insert the following:

Executive Committee.

The Executive Committee shall be the Business Committee of the Association, to whom shall be referred all business not otherwise specially provided for. They shall report at each meeting under the proper head, their doings for the current year.

1st Division Committtee of Arrangements.

This Committee shall be composed of nine members —three of whom shall act as the Committee of Arrangements, and shall procure suitable accommodations for the meetings and clinics, and for the exhibition and examination of appliances, of which they shall have care. They shall attend generally to the wants of the Association during its sessions. These three shall, if practicable, reside at or near the place at which the Association is to hold its next annual meeting.

2d Division, Auditing Committee and Credentials.

Other three shall examine and verify the credentials and qualifications of members, and shall also be the auditing committee for that year. The remaining three shall examine all volunteer essays, and before they are read to the Association shall give their approval, in order that time may not be taken up with unworthy or irrelevant matter. They shall report names for the standing committees for the ensuing year, and the names of places for the next meeting.

3d Division, Nominating Committee and Volunteer Papers.

Publication Committee; how appointed.

Immediately after the election of new members to the Executive Committee, two from that committee shall be appointed by the President, to act in conjunction with the Recording Secretary as the Publication Committee. They shall be authorized to employ a competent reporter to furnish an accurate report of the proceedings of each meeting. They shall superintend the publication and distribution of such portions of the transactions as the Association may direct, or the committee judge to be of sufficient value. They shall specify in the Annual Report of this committee the character and cost of the publications of the Association during the year, and the number of copies still on hand. This committee is hereby instructed to print, &c., (see Constitution, page 15, line 7, 1860.)

Instructions to Publication Committee.

Reports of sub-Committees.

Each of these sub-committees shall report from time to time, as may be necessary, to the Executive Committee as a whole, which shall decide upon such report if possible, but in case of their inability to decide upon any matter, it shall be brought before the Association for decision as early as practicable.

Election of Executive Committee.

At the first election of this committee the first three shall be elected to serve three years, the second three for two years, and the last three for one year, and thenceforward three new members shall be elected each year, by ballot, to serve three years, and in case of the absence of any member of this committee, his place may be temporarily filled by the remaining members of the committee.

Meetings of the Executive Committee.

The Executive Committee shall, if possible, meet for consultation and arrangement of their respective duties, on the day preceding the Annual Meeting of the Association, and shall meet for the examination of credentials, the arrangement of appliances, the reception of papers, and such other business as may properly come before them at 8 o'clock A. M., on the day of the annual meeting. They shall also meet after

the election of new members to the committee, to choose their own Chairman and Secretary and to divide themselves into three sub-committees as hereinbefore provided and for the purposes described. The Chairman of this committee may, at his own discretion, summon the members thereof to a meeting, at any suitable hour during the sessions of the Association.

The Chairman may convene.

[Insert.]

Treasurer.

The Treasurer shall hold all moneys belonging to the Association and shall keep an accurate account as between the Society and its members.

Attend to receive dues.

He shall attend the meeting of the Executive Committee at 8 o'clock, A. M., on the day of the annual meeting to receive dues, and shall attend at roll call to verify the list of names, checking all such as are in arrears for dues. He shall restore such names upon payment of dues within the legal limits, and shall notify all those whose names may be erased from the list of membership. He shall pay the drafts of the President, countersigned by the Secretary, upon vote of the Society only, and shall report to the Executive Committee, where his accounts shall be audited, and by whom his report shall be presented to the Association together with their own.

Pay Drafts of President and Secretary.

Report to Exec. Committee for Auditing.

Rearrangem't of Committees.

The VIth Article, relating to standing committees, to be rewritten to make the different portions conform to the amendments herein proposed, but without other material alteration; this would, however, dispense with the present committees of arrangement, of publication, of volunteer essays, and on instruments and appliances.

[Insert.]

Quorum.

Fifteen members shall constitute a quorum, for the transaction of business in this Association.

Suspending order of Business.

The order of business may be temporarily suspended by a three-fourths vote of all the members

present for the consideration of a specific subject, upon the completion of which, the regular order of business shall be at once resumed.

No alteration or amendment shall be made in these rules of order except in the manner prescribed for other portions of the Constitution. Alterations.

ORDER OF BUSINESS.

Order of Business.

1st. Meeting of the Executive Committee, filling of vacancies therein, examination of credentials and the payment of dues,—8 o'clock A.M..

2d. Organization of the meeting,—10 o'clock A.M.

3d. Calling the roll of qualified members.

4th. Reading of the minutes and action thereon.

5th. The reading and consideration of the stated Annual Reports from the standing committees together with volunteer essays upon the same subjects in their consecutive order.

6th. Report of Executive Committee.

7th. Balloting for the place of the next Annual Meeting.

8th. Election of officers and three members of Executive Committee.

9th. Appointment of Standing Committees.

10th. Instructions to the permanent committees.

11th. Unfinished, new and miscellaneous business.

12th. Adjournment.

E. A. Bogue,
Wm. H. Goddard, } Committee.
W. H. Morgan,

On motion the report was accepted, and the order of business unanimously adopted, to be in force from the adjournment of this session.

On motion of Dr. Atkinson, Dr. Dickerson's resolution of last year that the time of meeting be changed from the last Tuesday in July to the first Tuesday in August, was adopted.

On motion of Dr. Kennicott:

Resolved, That the committee be instructed to prepare and publish a synopsis of parliamentary rules for the Society, to be ready for use at the opening of the next meeting of the Association.

The special Auditing Committee reported as follows:

The committee to andit the report of the Publishing Committee for 1866 respectfully report, from the data before them, the same to be correct.

W. H. Goddard,
W. H. Morgan, } Committee.
W. H. Atkinson,

Niagara Falls, July 30, 1868.

On motion, the report was accepted and adopted and the Committee discharged.

The Committee on Operative Dentistry was called upon, but made no report, and the subject was passed.

The following report of Committee on Mechanical Dentistry was made by Dr. Spelman, Chairman.

REPORT OF THE COMMITTEE

ON

MECHANICAL DENTISTRY.

B. T. SPELMAN, CHAIRMAN.

Mr. President: It is expected that the Committee on Mechanical Dentistry will be able to inform the Association in regard to—

First. All the improvements in this department during the last year.

Second. The present status of this department of our specialty.

Third. We are expected to advance such views and give to the Association such suggestions as to them may seem of any value.

1st. As regards discoveries and improvements, your Committee have but little to report. We have written to various parties who claim to have made new discoveries in this department, asking them to put us in possession of some facts in regard to their inventions which would enable us to make an intelligent report, assuring them that the Committee would deal fairly with them.

Doctor G. F. J. Colburn of New York answered one of the letters in so frank and gentlemanly a manner, that we feel it our duty to give it more than a passing notice.

We quote from his letter as follows:

"I know that I have succeeded in making a compound that will answer for temporary work; that is, one that will withstand the wear and tear of mastication, and also destruction by the fluids of the mouth, for a period of six months or more. * * * We have still kept experimenting to improve on the original composition, because in some mouths we found that after being worn for some time some of the ingredients were taking leave of the others."

The Doctor now claims to have overcome this difficulty. But we will again let him speak for himself:

"We are preparing to put the compound in the market again, feeling that in its present improved form it will at least prove a good material for temporary work."

A part of your Committee have seen some of this material, and think it will answer for such cases. Being sufficiently strong, easy and quick to manipulate, it is quite as good as rubber for such cases. It is no advantage to the patient or the dentist to have temporary work last too long.

Aluminum, as a base for artificial dentures, has been experimented with extensively; but your Committee are unable to report any progress with it.

Iodized rubber seems to be received in the Eastern and Middle States with much favor, and being recommended by some of our

best men, we have thought it our duty to investigate its merits, and to this end addressed a letter to Messrs. Newbrough & Fagan, asking them to put us in possession of some means to test the merits of their invention. To that letter we received the following reply:

"DR. B. T. SPELMAN—*Dear Sir:* In a few days you will receive by express some baked and crude rubber.

"Yours, respectfully, NEWBROUGH & FAGAN."

We are sorry to report that we never received the promised material; but a few weeks ago we received a large package of circulars such as has been sent to almost every practitioner in the country.

This rubber being hardened by a new process, we ought to know whether or no it will soften in the mouth, or absorb the secretions of the same and become offensive. It is not sufficient to be assured that it is deodorized and tasteless, as well as possessing all the necessary hardness and strength when it is ready for use.

Dried vegetable ivory possesses all these properties, but it will soon soften when worn in the mouth. Will not "dried rubber" do the same? Your Committee has no prejudice against this new preparation, but fondly hope that it is all the inventors claim for it. The wicked raid made by the remorseless Rubber Company on the profession we fear has led some good men to be too sanguine and hasty in recommending it. And we make these remarks to bring the subject properly before the Association for discussion, hoping that its friends will be able to show that it is superior to the *vulcanite rubber*.

The Simpson rubber, though possessing some good qualities, has disappointed the hopes of very many members of the profession. We should therefore be less eager and more careful in regard to this new preparation. The Rubber Company is now powerless. We can afford to "make haste slowly." It is nothing but rubber when we get it.

Dr. J. A. McClellan was invited to meet your Committee at Columbus, Ohio, on the 24th of December last, that we might

learn something from him in regard to the merits of his "Rose Pearl." He was assured that we would be glad to do him justice in our report to this body. But he did not see fit to meet with us, or even answer the letter. Of its merits we know nothing; but we are glad to report to this body that there is considerable time, industry, and talent devoted to the discovery of something which will take the place of the much-despised rubber now in general use. And these parties, whether they are successful or not, are entitled to the thanks of the profession.

In the West the porcelain style of work is still growing in favor. For strength, beauty, and cleanliness it is not surpassed by any class of work yet introduced to the profession. The natural expression of the mouth, as well as the contour of the face, can be restored by it as well as with continuous gum work, so justly popular; and, unlike the latter, it can be ground away if it should be found too full in any place after it is baked, and the marks of the stone can be covered with a coat of gum enamel that will fuse at a lower heat than the gum previously used. There is no trouble experienced in making it, and as a general rule an upper set can be ground to a cast of the mouth in about the same time which will be required to grind a set of blocks for rubber cases. When it comes from the furnace it is ready for the mouth except the grinding; therefore there is no filing, stoning or lathe work required to finish it.

Some members of your committee have been located where they could observe the success of this class of dentures for the last fifteen years; and think, though in most cases in the hands of incompetent men, it has given good satisfaction to *their* patients. Being a good conductor of heat, the mouth keeps as cool and healthy as with gold or continuous gum work, and it is not as heavy as either. One member of this committee is interested in the sale of this class of work, but he has not been consulted in regard to what we have thought it our duty to say on the subject. He too was invited to meet us at Columbus, as were Drs. Colburn and McClellan, but he neither put in his appearance nor did he give us an excuse for his absence. If it were not our

duty to report to the Association what we *know* of this class of work, we would treat him with the same indifference.

In the department of palatine obturators there seems to be a steady advancement towards perfection. Drs. Kingsley, Bogue and Harroun have been so successful in this department, and simplified the *modus operandi* to such an extent, that the student who in the future may desire a description of the operation for staphyloraphy, must look for it in the works that have become obsolete.

Your Committee do not think it necessary to give the *modus operandi* of anyone making differently constructed appliances now in use. Dr. Kingsley has so simplified the manner of obtaining flasks to duplicate his appliance, that it is now within the reach of any man of genius, who may wish to extend his usefulness in this direction, to construct an appliance with comparatively little difficulty.

We think that *great* credit is due him for his efforts in this direction.

Dr. Bogue has prodnced nearly the same results in simplifying his manner of work, and we believe, gave some ideas before this Association at Cincinnati. Dr. Harroun has had marked success in this direction, simplifying the appliance more particularly than the flask. There has been introduced into this country, through one of the journals of Dental Science, a so-called new idea. Our German friend claims superiority over all of the flexible rubber appliances. The newness of this method is disputed by Dr. Kingsley, who claims to have thrown it aside some eight years since as worthless. There is a diversity of opinion existing among the different operators in this specialty as to what shape the rubber should be moulded, and condition in which it should be found when vulcanized—hard or flexible.

Kingsley claims that flexibility is the only condition, and with appliances made upon his principle (or the one he sets forth) he is correct, whereas Dr. Bogue, also Harroun, and our German friend over the way, do not hold to this principle only in part. Dr. Bogue, also Harroun, use sometimes flexible, sometimes the two combined, and our German friend, entirely hard rubber.

We think there is much merit in each and all of the appliances now constructed, and as every year bring us nearer to the one great object sought for—a thorough knowledge of principles—we hope before long to all be able to say of a truth we have found it.

2d. As it regards the *status* of this department—Mechanical Dentistry—there seems to be no improvement except in the treatment for cleft palates. With the advent of rubber work came a class of ignorant pretenders, who had no qualification but impudence; many of whom are not unlike Pollock's fool, who "never had a dozen thoughts in all his life." They have ever since hung with increasing numbers like a frightful incubus to the skirts of the profession, tiil many, very many, of our best men have left the laboratory in disgust. And those, or most of those, who remain take no pride in it, and are paralysed for good.

This is the effect of the rubber advent. Why should the profession not resist the claims of the Rubber Company? Why should not the dentists of the West meet them on the very verge of their Buckeye State, and kick, buffet, and insult them at every corner? and defiantly meet them in every court of justice which they have chosen, for their own discomfiture? We have shown them of their conceit, heaped on them the costs of court in every case, and sent them back wiser if not better men. They have learned that we "have millions for defence, but not one cent for royalty." With us they have fought their last battle; and we will

> "Let them sleep in the shade
> Where cold and dishonored their relics are laid."

The gloom, however, is not impenetrable. There is a growing desire in the minds of the people for a better class of work, and they seem more willing to patronize a better class of men, who can supply them with dentures on gold, platinum and porcelain base, classes of work which require a higher order of learning and skill than most of the rubber manipulators possess or *can obtain.* Nor is this all; there are other beacon lights burning which inspire us with hope and gladden the heart. In Ohio and New York the profession is already organizing under a humane dental law. No more quacks can prey upon the people or the profession

in the former State; and unless the committee appointed to examine those practitioners who *now* reside there, and have no diplomas, defeat the object of the law, in three years more a quack will not pollute her soil. Then mechanical dentistry will assert her dignity, and rise to that proud eminence which her importance demands.

3d. As to the views which it is our duty to advance to this body, we would respectfully remark, first: that it is the *duty*, and should be the *aim* of the dentist to construct an appliance, the proper adjustment of which will *restore* the contour of the face, and alveolar border,—the natural expression of the mouth and adjoining features—the articulation of the voice, and the means for the proper mastication of the food. Now a comparison of a mouth having a perfect natural denture, with one from which all the teeth have been removed, will show that the process of absorption which follows the extraction of the teeth has caused a very considerable loss of substance, which must be replaced in order to give the mouth its original form. This loss is much greater in some mouths than in others, and varies in extent, in different parts of the same mouth:—it is mostly confined to the alveolar border, but sometimes is found to encroach upon the palatine arch. As results of this loss, we observe that the jaws close nearer together, the cheeks and lips fall in for want of their proper support, and the tongue is enlarged and widened out, as nature endeavors to occupy the space occasioned by the destruction of the parts. It is for the dentist, by his knowledge, judgment and skill, to determine just the extent of the loss, and to use the means to restore it.

The usual method of putting up gold plates, using single teeth attached to the plate by a backing, comes so far short of meeting the requirements in an artistic sense, that it is only necessary to call attention to its deficiencies to bring it under condemnation. And here let us say that these remarks apply to the construction of full dentures, and not to partial cases, for in our opinion, gold is best adapted to partial sets in almost every instance.

But the simple fact that it is impossible to give a full case on gold the original form, or the natural fullness of the parts, or

to secure an artistic arrangement of the teeth, and want of cleanliness too, which is notorious, are serious objections to its use, and which are only imperfectly overcome in the combination of gold and hard rubber.

In Allen's "Continuous gum work" we find our ideal almost perfectly attained, for by its use a very complete restoration of form and substance can be accomplished, as the porcelain body and enamel can be built upon the platina plate, to any desired shape or degree of fullness. We also get rid of that stiff, regular, artificial appearance of the teeth, for they can be arranged in any position which the taste or judgment of the operator may suggest, to secure a natural and pleasing expression;—the perfectly lifelike color and appearance of the gum enamel covering the whole exposed surface of the plate, is another of its beauties.

Having now given our views in regard to the relative merits of the means at his command, we will close this hastily and very imperfectly prepared paper, by repeating the sentiment before given, that it is the *duty* and should be the *aim* of the dentist, in common with the physician and surgeon, to ameliorate the varied ills and sufferings of humanity, and to correct the deformities and supply the deficiencies occasioned by the loss of any part of the physical structure, by the use of *the means* which will enable him to accomplish these results in the *best manner*. Anything short of this is not in keeping with the progress of this era, or the advancement made in other departments of our profession.

REPORT OF THE COMMITTEE

ON

PRIZE ESSAYS.

A. W. FRENCH, CHAIRMAN.

Mr. President: The Committee on Prize Essays have the honor to report that no effort to obtain the prize of fifty dollars for the best essay has come to their knowledge.

Thus far this report is identical with that made at each of the previous meetings of the Association since this committee was constituted. This fact may suggest to the Association, as it has to the committee, the question whether the title of this committee is not a misnomer and should be changed, and the committee assigned other functions than that of comparing essays, or be altogether abolished, having no duties. The custom has prevailed, however, as we learn from the transactions, for the members of this committee to write essays rather than sit in judgement on the literary productions of other members of the Association. In pursuance and for the continuance of this laudable custom, the suggestion is made that the name of this committee be changed to that of "Essay Committee" and that its special duty, (not, however, to the exclusion of any other member) shall be the preparing and reading of essays at the meetings of the Association. In accordance with the practice on former occasions several members of the committee have prepared papers which await the call of the Association, and the chairman begs leave to offer a few disconnected remarks in connection with this report, relevant or otherwise, pertinent or not, to the cause for which we all labor. It is pleasant to me to observe that as the dental profession has dropped the swaddling garments of infancy, passed through the growing pe-

riod of childhood, and has entered upon responsible adult life that increasing solicitude is felt by its members in regard to the proper qualifications of those who are to engage in its practice. When we consider that the standing of each dentist is influenced and affected by the average and aggregate worth of all who claim to belong to your profession, the importance of a proper training of candidates for a place in it is readily appreciated. Each member is directly interested in the worth and character of each other member, and either borrows or lends lustre from or to all the rest.

The characteristics which mark a man's professional life are generally those which were stamped upon him as a learner; not only his modes of practice but his bearing, his manners and his modes of thinking, are taken bodily from those who taught him, and he can no more change them than he can forget what he has learned. Professional education, as I understand it, consists not simply in the acquiring enough information, theoretical and practical, to enable one to imitate the work of a good dentist, but it is the province of a good educator to impress upon the heart of the learner a love for the right and a hatred of wrong, and to inspire him with a high sense of honor which shall restrain him from unworthy acts, as well as urge him to make efforts to excel in the worth of his services. The committee on the "Qualifications of Students" have made some very good suggestions on that subject. To these suggestions they have received five-hundred responses from the eight thousand practitioners in the United States, one in sixteen, and this is perhaps half of all who would favor the proposal, or any other changes having in view a higher standard of qualification. Before you prescribe conditions on which you will welcome an applicant for brotherhood would it not be well to determine whether yours is a distinct profession with clearly marked boundary lines, not easily mistaken or overlooked by anybody? Who compose what you style the dental profession? If as a matter of courtesy you admit that one-half or two-thirds of the seven or eight thousand now paying license as dentists are all that the best of you could require them to be, both as men and as dentists, how are you to know them from the rest? Are you obliged to take by the hand and call him brother every man who

says he is a dentist? You may be cognizant of acts committed by him which would disgrace the basest. Are you to feel yourself compelled by his pretenses to own fraternal relations with him, to speak well of him to your enquiring patrons and assure them that he ought to have a place in their esteem? Can a truth-lover do this? Or if this is to be considered a venial falsification because spoken to the probable detriment of the speaker, can you deliberately advise those who confidingly ask your judgement in the case, to imploy incompetent persons in a professional capacity? If not, what should be your conduct towards the quack next door, and what answer should you give to those of your friends who ask but your recommendation to give him their patronage? Honor, principle, a regard for truth, all clearly require you to say just what you think, and to warn your friends against the knavery that will plunder them in at least two ways. It is to me but little short of atrocious to daily help to cover ravaging wolves with wool because of a repugnance to saying an unfavorable thing of one in the same line of labor. This is a test of the love of truth to which many of you are put almost every day, perhaps with different results in different cases. It is an unpleasant dilemma to all but the boldest natures. As a relief, many dentists are soliciting legislative interference.

Legal enactments are asked disqualifying a large class for practice, and compelling all to submit to certain tests before being allowed to invite patronage as dentists. Such laws can be easily obtained in some of the States, and no moral reasons can be urged against such restrictions, and in countries under monarchical government restrictive laws doubtless serve a good purpose, and are entirely approved by the people. But in our country it may be a question whether such hindrances to the enterprise of any class of its citizens are exactly in harmony with the spirit of its boasted free institutions, and its often repeated call to all the people of the world to come and find their level without obstacle.

And, moreover, a people whose every second word is either liberty or freedom, are restive under restraints that have the appearance even, of favoring any set or class of persons to the

detriment of others. All claim the right to employ persons of their own choice, and it is, doubtless, one of the inalienable rights mentioned in a certain solemn document with which all are familiar, to be drugged, and carved, and repaired by men of our own selection. A law not enforced is a little worse than no law, and it is more than doubtful whether under a free government like ours laws restrictive enough to be of any benefit to the profession can be enforced, as all know that the vitality of any law depends upon the popular respect for it, and its efficacy is the measure of that respect. In every trial for alleged infraction of law there is a direct appeal to the people, represented by the jury, and the violator of law is declared guilty or not guilty as the jury may think the act proved to them ought or ought not to be a crime.

This is fully illustrated in the attempted restraints upon the sale of spirituous liquors. The effective force of the enactment is no better than the sentiments of the people.

No! the remedy for the ills of quackery is in your own hands, or at the least you should do what you can to relieve your profession of its disreputable members before calling on the law-making power to protect you from unworthy competition, and your patrons from those who would "spoil" them. Let the restriction be first felt from within, and outside protection may not be necessary. To this end I beg leave to make the suggestion that perhaps the local societies can be made more efficient than they have heretofore been. Let there be societies organized in every part of the country, embracing not more than a State each in extent of territory, and let members of these societies, some of whom will be acquainted with every applicant for membership, see to it, as they prize their own reputation, that no improper person shall be admitted, and no improper practices shall be tolerated among its members, and your characters as dentists will need little other protection. It will soon be seen who is and who is not held in esteem by those best qualified to judge of the merits of those who claim to be dentists, and a certificate of membership in a society will be as good evidence of a respectable position in the profession as a diploma can possibly be. But under the lax administration of the rules of societies

which has to some extent been tolerated heretofore, under which every applicant is admitted almost without question, one of the chief benefits that should be derived from these organizations is lost, and even the slight barriers erected by competition between the good and bad, which have been a partial shield to communities, have been broken down, and the worthy and unworthy inconsiderately placed on a level. It is a monstrous stretch of courtesy to accept as a brother every man who calls himself a dentist, though you may be personally cognizant of his ignorance or his dishonest practices, and to hide his demerits by admitting him to your society, and so calling him your peer and friend, rather than be guided by your own sense of right and leave the unworthy to stand on his own merits. All cannot be equally successful in your or any other calling; but all may have equally high aims and inflexible principles, and after doing what they can well do, may leave to their superiors such cases as baffle their skill, and so fairly win such a standing as they may deserve in the community, and be entitled to fraternal recognition by the profession. The encouragement in any way of the other class not only lowers the character of the whole profession, but it makes it easy for the unprincipled to victimize the people, who trust you and those with whom you associate and whom you commend. And at this time, when perhaps more than ever before the cheap and simple is substituted for the valuable and difficult, is there not danger that your profession may prove a bane rather than a benefaction to your generation? Though a few of the better class of dentists (few I mean when compared with the whole number) are doing all that in them lies to preserve the natural teeth, yet it is undoubtedly true that at no time have these organs been swept away by the dexterous hand of the tooth-puller so rapidly as at the present. Between the heavenly gas, which has changed a once fearfully dreaded operation into a delightful titillation, on the one hand, and the promise of the ever ready and wonderfully cheap compounds of caoutchouc, sulphur, and mercury, on the other, the people are being deprived of their teeth at a fearful rate, and ours is likely to become a toothless nation. Who shall say that if this destructive

practice is continued through several succeeding generations, and one generation after another shall have been thus plucked before arriving at mature years, that nature, taking a hint that teeth are no longer wanted, may not decline to furnish the germs of these organs, and that children may not be born incapable of developing them! It is doubtless with you as with me, a daily duty to combat this almost insane desire to lose valuable teeth, sometimes in whole sets at a time, at some painless gas shop, in order to get others a little more regular, or to be certainly free from all tooth pains in the future; and these pernicious notions have been derived from the class of dentists referred to, who, lacking the skill necessary to the preservation of the decayed teeth, or despising so small a fee as they would receive for efforts in that line, gravely advise that all the teeth be removed and replaced by a "bran new" set, as the end of all the needs of the victim. The advice looks sound to the willing sacrifice, especially as all previous attempts by the same operator to arrest decay have clearly proved abortive—it and the gas are taken at once, and there is secured in perpetuity another good patron of the noble science of dentistry. This is a grave evil, and demands that a clear and broad line between the conservative and the destructive dentist should be drawn. Look about you in hotel, steamboat, rail and horse car, and see what the people get in return for the teeth of which they have been so easily and yet so foully deluded. No; you need not look for it; it thrusts itself upon your view. You behold it at the distance of a square off, and a sorrier sight meets not the vision of a sensitive man. Protruding lips and awry gums lined with glittering white masses of porcelain, as well adapted to the wearer as if one model only was used for all persons, meet your eye at every turn. These mouth-stuffing aggregations of incongruous materials are supposed to redeem the pledge made when the patient was lulled to sleep and the crime of mayhem committed upon him. These are what he has to show (and most painfully to the beholder does show) for his natural teeth and his money.

Rubber is rampant, if not triumphant, and fitly illustrates the skill and symbolizes the conscience of many who commend it.

But, gentlemen, better practice will prevail. The influence of this Association is altogether in favor of conservative treatment, and that influence is felt by every dental practitioner in the land. The people, too, read with lively interest your discussions, and the transactions of the local societies, and are becoming enlightened in reference to their own interest in the matter; and the day is not distant when the dentist will be required to make use of every known means of saving a tooth before extraction will be thought of, and this last operation will be deemed (as some one has said) as legitimate treatment of the toothache as amputation of the neck would be of the headache.

Dr. Corydon Palmer, Chairman of the Committee on Volunteer Essays, read the following Paper on the mode of taking partial impressions of the mouth for artificial teeth.

THE MODE OF TAKING PARTIAL IMPRESSIONS

FOR

ARTIFICIAL TEETH.

BY CORYDON PALMER.

Mr. President: There are various modes for taking impressions; I need not enumerate them.

So far as we know, plaster is the most reliable substance for the purpose with which we are acquainted; there are many cases, however, that cannot be reached with the ordinary cup and plaster alone, particularly where there are remaining teeth to be fitted around. Such are the cases that I have chosen to speak of in my short paper.

I shall make my illustrations from the superior maxillary, because it suits my present purpose best.

Let us suppose we have a case where the superior incisors are wanting.

Or another, where the superior laterals and first bicuspids are wanting.

Or another where the right superior central and lateral with one bicuspid are wanting.

Or another, where the right superior lateral alone is wanting, all of which are difficult cases to take an impression from with wax or plaster alone that will be sufficiently reliable to work from.

The teeth being smaller at their necks than at their crowns, if wax is used, when it is taken from the mouth it is so drawn out of shape when leaving the teeth that it is rendered totally unfit for use.

If a cup and plaster alone are used, when the plaster sets it becomes so fixed about the necks of the teeth that it is with the greatest difficulty it can be removed from the mouth.

If wax and plaster are used together a much more satisfactory result will be obtained, all of which I think you are with me ready to admit.

In almost every case for full sets there will be an advantage in using wax in the cup, for the reason that with the addition of wax a better adaptation to the mouth can be had than with the cup alone.

If any one of us, after having lighted a spirit lamp, should hold in the left hand a portion of pure native beeswax, and in the right hand a tolerably stiff case knife, and pass the knife forward and backward through the flame of the spirit lamp so as to warm it, and then pass quickly the wax held in the left hand over the flame of the lamp so as to warm its *best broad surface*, and then with the warm knife quickly shave off the warmed and softened surface of the wax, and then rapidly repeat the same until a sufficient quantity is shaved off, and then warm again the knife and work the wax as with a spatula until evenly softened, and then gather it up and put it into the cup made into shape, and take an impression of the mouth by first bringing up to place and then moving it a little from side to side, then back-

wards and forwards, so as to make the wax impression a little too large, then withdraw from the mouth, place it in cold water to harden, after which trim smooth the edges, paring off any surplus wax that may be in the way of returning it to the mouth; make an undercutting along the upper and inner edge of the impression; smooth with the lamp and blow pipe; cool and fill with plaster and apply to the mouth; give time to set and then withdraw, we should have a better impression than if the cup and plaster were used without the addition of wax.

If any one of us should desire an impression for a partial upper set where there are natural teeth remaining to be filled around, or a single tooth, for instance the superior right lateral, and we should prepare some wax as above described, and form up as much as can be carried upon the first and second fingers of the right hand into the mouth, and pressed up so as to cover the entire roof of the mouth and the grinding surfaces of the molars and the bicuspids, and a full impression of the front teeth adjoining the lateral, extending the wax forward so as to give body, and up so as to give height in front of the lateral, and downward so as to give strength, and when all is pressed up to place in every part, lastly, with the forefinger of the right hand placed underneath the wax in the roof of the mouth and the thumb against the front of the wax, press the forefinger in such a manner as to form a hold to remove the wax by, and afterwards the impression; then remove, harden in cold water, then with a warm knife trim down the wax on the outside of all the teeth but the adjoining ones to the lateral even with the grinding surfaces, letting the wax protrude a little beyond the outside of all the back teeth, then with the point of the warm knife follow across the back part of the impression and around the insides of all the teeth, and forward as far as the impression extends for the lateral, and then with the warm knife cut out to the depth of the sixteenth of an inch the wax from the line upwards and over the arch, making some undercuts in the surface of the wax, and be careful to cut out the wax between the lines, so as to give depth to the part that extends between the cuspid and central; trim the outside so that it will go into the mouth nicely, and pare out

the place for the forefinger in the roof of the mouth; then smooth the outside of the wax with the large flaring flame and the inside where the trimming has been done with the fine jet made with the blowpipe, then cool in cold water, then have the patient provided with a napkin, mix the plaster, sifting the plaster into the water, stir until well mixed and smooth, direct the patient to dry the mouth with the napkin, put enough plaster upon the wax to cover the arch and between the teeth where the lateral is to go, and with a quick movement with the round, broad point of the plaster knife carry a portion of plaster to the deepest part of the roof of the mouth and quickly apply the wax holder containing the plaster, bring up to place, being careful to get a full impression of the front teeth adjoining the lateral to serve as a guide, give time to set, then place the forefinger of the right hand in the hold inside of the mouth and the thumb outside on the wax, and move gently, press along the sides gently, and then the center until the whole is removed; look carefully for any fractured pieces and readjust them, and we may have a better impression with less trouble to ourselves and less discomfort to our patients than when plaster is used alone in the metal cup or in combination with wax in the cup.

To sum up my reasons for recommending this mode of taking partial impressions:

First, let me say that plaster, being best for taking impressions, it is desirable to use it in every case.

To use a metal cup and plaster alone for partial sets, is hardly practicable at all, or in few cases.

Secondly, the cup is in the way, and furthermore, it holds the plaster about the outsides of the teeth where it is not wanted, and the same difficulty arises when wax is used in connection with the cup, making it far more difficult to remove from the mouth than when wax and plaster are used without a cup.

Thirdly, in case the wax holder and plaster impression will not leave the mouth, the wax can be readily removed, and the plaster, being thin, can be easily broken up and the mouth relieved, whereas, in case the metal cup and the plaster alone were used, it could in many cases scarcely be removed at all, and that with

exceeding discomfort to the patient. In taking the impression of the inferior teeth for partial sets the cup may be used with advantage by cutting away its outer rim and lining with wax as before described.

Having thus given you my views and hoping my efforts may be acceptable, I will close by presenting you with a model of the wax holder which will show more plainly than I can describe.

Dr. C. R. Butler, chairman of Committee on Dental Therapeutics, made the following report.

REPORT OF THE COMMITTEE

ON

DENTAL THERAPEUTICS.

C. R. BUTLER, CHAIRMAN.

Mr. President: If it was expected that the appointing of a special committee would secure a complete summary on the use of therapeutic remedies specially adapted to our department of medical science, I fear most, if not all, will feel disappointed, so far as I am concerned as one of the committee.

For there are no written data systematically arranged, that can be taken even as way-marks in this field of exploration.

The report that I have to bring will of necessity be brief, and perhaps uninteresting.

The facilities are such at the present day, however, that there is no longer a legitimate excuse for using crude, or impure medicines, and they should be used in such form, whether they be by application, or administration, as that the desired effect may be obtained in the shortest time.

The concentrated forms, such as tinctures, extracts, alkaloids, &c., are especially adapted to our practice. The more readily a remedy is brought into solution when administered, the sooner it will be carried to the seat of the disease through the circulatory system, which is conceded by the best authorities to be the *modus operandi* of medicine, in the case of disease.

The treatment of sensitive dentine should claim a brief notice at least.

All attempts at medication must involve time. I have had the best results to follow the use of carbolic acid, and the acetate of morphia, as a local remedy. Having removed all the softened dentine from the cavity that is possible, slightly moisten a pellet of paper in carbolic acid, dip it in the morphia so as to take up a small amount, place it in the cavity securely for two or three hours.

Some recommend the use of arsenious acid in some form, applied in a similar manner.

But I do not consider it safe under any circumstances, to use for the obtunding of sensitive dentine; for, owing to the different degrees of porosity in the dental tissue, its action thereon cannot be limited.

Chloride of zinc, caustic potash, chromic acid, &c., have been used with varying success.

Creosote or carbolic acid is the great panacea for tooth-ache. Tinct. of aconite and wine of opium—equal parts—may be substituted in most cases, and would not be so destructive to the soft parts of the mouth in the hands of the laity.

Tincture of aconite. *Radix* and aconitine granules, 1-60 of a grain dose, I have found to work favorably in the treatment of facial neuralgia and periodontitis.

The tincture may be locally applied to the gum either on lint, after scarifying,, or it may be applied with the hyperdermic syringe.

The aconitine granules may be taken, one at a dose, from 3 to 6 hours apart.

A saturated solution of camphor in chloroform may be sometimes employed with benefit, on the gum, or face, with friction, as a rubefacient.

As an alterative, in all such cases the compound cathartic pill, prepared by Bullock & Crenshaw, Philadelphia, may be administered. Dose 1 to 3, according to indications.

When a diaphoretic or antiphlogistic is indicated, tartar emetic, one of the best antimonials known, may be used in small doses—$\frac{1}{8}$ to $\frac{1}{4}$ of a gr.—every half hour, or hour, as the case may demand, and it may be necessary to continue it for twelve hours or more.

I might run over and theorise upon the use of a long list of therapeutic remedies; but I only deem it legitimate to present those that have been put to a practical test to some extent.

Dental therapeutics proper, may, or may not, have a very limited range. It will vary according to the conception and ability of the practitioner in the profession.

The knowledge of therapeutics is not what it ought to be, for it has had but a very limited amount of time allotted to it in the curriculum of teaching in the dental schools.

And there are but few individuals who have the time or ambition to plod through the voluminous text books, or the general subject, and cull out from the great catalogue of remedies, and arrange them for use, in the practice of our specialty.

But when a case presents, with some trouble expressed locally, which has its rise in some other part of the system, it has been the custom of many operators to refer the patient to their family physician, as the best thing they could do. We ought to have a general knowledge, at least, of therapeutics, or we are not worthy the name of doctor.

The case of polychrests, that graces or disgraces every office, scarcely proclaims us to be devotees to specifics, notwithstanding the claims that are stubbornly made by some for certain remedies.

It is better, however, to have a few well selected remedies, and understand their therapeutic value, than try to use a large number at random, trusting to the laboratorial powers of the system to select, prepare, and appropriate anything that may be of benefit, and reject the rest as effete matter.

Chloride of zinc, in varied dilutions, is a valuable remedy in

the treatment of a number of the diseases of the oral cavity, as a local application to alveolar and maxillary abscesses, fistulæ, &c., of long standing.

The solution may be used to clear them out, followed by the daily use of carbolated iodine—a favorite remedy in all departments of surgery.

I had some prepared recently after the following formula:

℞.	Tinct. iodine, comp.,	3 grm.
	Acid carbolic, liquid,	6 M.
	Pure glycerine,	180 grm.

The advantage of this preparation is, the iodine is not so readily given off when exposed while using.

For a bland astringent the preparation of tannin and glycerine is the most acceptable.

The use of the phosphate of lime to remedy defective dental tissue, I do not yet perceive the advantage claimed for it by some members of the profession. I do not think there is a lack of quantity of this element, but a want of tone in the vital system to appropriate that which is taken with the food, either solid or in a liquid state.

Dr. J. A. Kennicott, Chairman of Special Committee on the subject of Neuralgia, not being ready to report, was granted an extension of time until the session of 1869.

REPORT OF THE COMMITTEE

ON

DENTAL INSTRUMENTS AND APPLIANCES.

L. D. SHEPARD, CHAIRMAN.

Mr. President: As this is the first year of the appointment of the Committee on Instruments and Appliances, we have had no precedents to guide us.

Such a committee may be of much service to the Association, but we conceive that there is great danger of its failure to accomplish good, unless its reports be free from favoritism and everything of an advertising nature.

We have not been able to test the instruments and appliances on exhibition, nor do we understand such to be our duty, even if it was in our power in the short space allowed us. We conceive it rather to be in our province to present them in such form that the Association can know what is claimed for them by their inventors, and in many cases have adopted their written statements of their claims.

1st. Improvement in dental chairs, by O. C. White, "whereby motion in every direction is secured for a head rest, and perfect fixation produced by the turning of a single thumb screw."

This improvement is admirably adapted for the purpose claimed. The head rest has a great range of movement in all directions, and is readily applied to all chairs requiring a head rest.

2d. Improved dental chair, by J. B. Morrison. This chair differs from other dental chairs with which the committee are familiar in these particulars: That the base offers no obstruction to the operator; the body of the chair has the greatest vertical

range; the back is readily shortened; the arms are adjusted readily to any height required. This chair has a compact and neat appearance, and the various positions and movements of the chair are attained with facility and ease.

3d. Dr. I. A. Salmon exhibits *Head Rest*, which is capable of being adapted to a variety of operating chairs. This head rest enables the operator to change the position of the patient's head with ease, and rapidly.

W. M. Butler exhibited model of dental chair, for which he claims all the movements of the ball and socket; that it has a backward and forward movement of 60°, a lateral movement of 40°; is operated by pressing the foot by two levers at the base, the levers readjusting themselves. The body of the chair is raised eight inches and the seat twelve inches. The footstool also moves up and down by means of a crank. The head rest it is claimed has twelve different movements and is but little complicated. The inventor also claims as a decided improvement that all the movements of the chair can be made while the operator is at work on the patient.

The same also exhibits a *Dental Table*, which is made of metal. It is furnished with five drawers, designed to hold the instruments, foil, &c., of the operator, and is intended to take the place of a dental case.

Also a *Spittoon*, of metal, supported by a bracket attached to the chair. It has a universal joint, which keeps the spittoon in an upright position at all times. An amalgamating cup, for saving all the gold passing into the spittoon, is one of the desirable features of this invention.

Dr. B. Bannister, of Michigan, presents a "Pneumatic Mallet" for filling teeth, claiming the following advantages: An instrument fully under the control of the operator; power or force received from a foot bellows; that it is simply an *air engine* operated by compressed air.

The spindle or plugger bar does not recede. It can be used wherever the hand mallet can, and is a hand pressure instrument till operated on by the bellows. The blow given rises in its impactive force from one to twenty or more.

Dr. I. A. Salmon, of Massachusetts, exhibits three automatic mallets, a direct action, a "back action," and an instrument containing both improvements. The first named the profession are familiar with. The back action mallet, as seen by us in the hand of the inventor, appears to be an effective instrument for condensing the gold in an anterior direction. Dr. Salmon also exhibits a convenient rack for holding the points adapted to his plugger.

Dr. S. C. Taylor, of Ohio, presents a "pressure and mallet plugger." It is operated by a lever handle; the hammer has a wooden face. It has a revolving socket and shaft which it is claimed enables the operator to turn the points of the instruments in the desired direction without rotation in the hand.

F. Searle, Springfield, Mass., an improved regulator for controlling the heat in making nitrous oxide, secures uniformity of temperature for any length of time required, and claims that by its use the quantity made per hour can be varied from three gallons to any quantity desired, and that it is easily adapted to any of the apparatus now in use.

A. W. Sprague, manufacturer, an apparatus for automatic regulation of the heat in the preparation of nitrous oxide; heat either from illuminating gas, oil, or alcohol. Also an arrangement for washing the gas. It is claimed in the use of these:

First—Purity of gas, not attainable by the common methods of heating.

Second—Saves nearly the whole time usually required in watching the heat.

Third—Does not allow the ammonia to waste by distilling it over at an undue heat.

Fourth—Does not break flasks and retorts.

Dr. John A. Mason, of Keokuk, Iowa, presents an improved pin for artificial teeth. The pin is made with four attachments, two are inserted in the tooth lengthwise in the strongest part, interfering, it is claimed, but little with the strength of the tooth. It is also claimed that by the resistance offered by the lower attachment, a large amount of leverage force exercised upon the cutting edge of the teeth when in use, is overcome. That part of

the pin attaching the tooth to the base is crosswise, giving, it is claimed, the greatest possible strength.

S. S. White, manufacturer, exhibits Pluggers, Excavators, and Palmer's nerve instruments.

These instruments are of improved patterns, and in temper it is claimed are superior to any heretofore manufactured by him. They are finished in the highest style of art, with fine and even serrations and beautiful polish. He also exhibits a new pattern of tongue compressor.

Buffalo Dental Manufacturing Company exhibits an extension bracket, with gas annealing lamp attached.

The extension is effected by one tube sliding in another, the joint between the two being made air tight. The annealing lamp is supported on an arm, having its motion on the pin which supports the table of the bracket and moves freely around it.

Hayes' Steam Compressor, for closing flasks inside the vulcanizer by steam pressure during the process of vulcanization. The pressure being very gradual, the accidents of misplaced and broken teeth it is claimed are almost entirely obviated. The instrument consists of a cylinder and piston, working steam tight and filled with water. The steam generated in the cylinder on the application of heat forces up the piston and closes the flask.

Dr. A. P. Southwick, of Buffalo, exhibits a new appliance called "Porous Compressors for the duct of Steno." This is a clay button, concave on one side. When applied to the mucous membrane it so rapidly absorbs the moisture that it adheres firmly and for a long time, and thus acts as a dam.

Also a new pattern for a duct compressor. This differs mainly from other patterns in the part of the instrument which holds the napkin in place under the tongue, without danger of the movement of the napkin, while the tongue is left free.

All of which is respectfully submitted.

L. D. Shepard,
E. A. Bogue,
H. A. Smith. } Committee.

The President announced that discussions on the preceding papers were now in order.

Dr. Bogue:—A year ago, at Cincinnati, I attempted to give a recipe which I had been in the habit of using, but it was entirely misunderstood and misquoted, and I will give it once more. The first idea came from Dr. Arnold, who has been in the habit of using arsenic and creosote for producing insensibility. The following changes have been made in it, very good results having been reported: Narceine, one part; Acetate of Morphia, two parts; Carbolic Acid, sufficient to make into a paste. This can be applied to all places where it is desired to produce insensibility. It should be left in from twenty-four to thirty-six hours. I have applied this during the last year fifty or sixty times, and have found as the result, one portion of the cavity nearly free from sensibility where the application had been thoroughly made, and the other portion just as sensitive as ever, where I failed to make the application.

Dr. Dunn desired to present to the Association, in a few words, the manner in which his plate was made and simplified. This plate which I hold in my hand was made by submitting it to but one heat. The teeth and plate together are made on one continuous piece, and, as you see, can be used under all circumstances, and I would say that my confidence in this work is strengthened by every year's experience, and I would not hesitate about putting it to a test with any work that has ever been used. I have tested it with continuous gum, with all the different styles, and have found it to possess superior advantages, and have heard persons say that there is a comfort about it which no other plate possesses.

Dr. Maxwell:—I was a member of the committee last year, and the investigation of porcelain work was assigned to me in particular, and I felt it my duty to give it a thorough investigation, and as I have had very little experience in manufacturing this kind of work myself, I felt it my duty to get the experience of others who had given it more attention, and who had better opportunities of knowing in regard to its merits than I had, and therefore I spent one day in visiting patients who had worn this

style of work in their mouths for from two to twelve years. I questioned the patients particularly in regard to the strength of porcelain work, as there is a prejudice in the minds of the profession and the people generally, against porcelain work, the idea prevailing that it is frail. I questioned the patients in regard to that point, and the universal evidence I received was that they had no fear of any breakage when applying the teeth to the use for which they were designed; no fear except from accident. I found some plates that had been worn for ten or twelve years, constantly, and found they had given entire satisfaction, and in my own experience I know of no other quality of work that would give as satisfactory proofs of strength as this has done. In regard to its beauty, we will all admit that it is equal to any other kind of work, and as to its cleanliness, that is self-evident. I questioned the patients also, with regard to the comfort with which they had worn those teeth in the mouth, because the question has arisen "Is it not clumsy, and does it not occupy too much space in the mouth?" I made examination and found that the plates were not clumsy; patients had not complained of that in any case.

I will mention one case which I now have in my mind—an elderly gentleman who has worn a set of artificial teeth for twelve years: I examined the upper plate, and found that in fitting it to the cast it had been ground until the gum color showed through, showing the translucent appearance of the plate—he saying that it was very thin at that point. That plate had heen worn for twelve years without breaking, and the party wearing that plate, when he understood my object in making the inquiry, said he: "You cannot overstate the good qualities of this kind of work."

Another case occurs to my mind, which I wish to report. It is that of a lady, the wife of one of the professors of Ohio University—a lady of very superior intelligence, taste, and refinement—who had worn an upper plate on gold for some years, and on account of the annoyance she experienced by the breaking of her teeth, she had substituted a continuous gum plate, made by Dr. Locke, of Williamsport, Pa., and which was as fine a piece of that kind of work as I ever saw. She was so pleased with it, that when a year had passed by, and she found it necessary to have a lower

plate made, she very reluctantly consented to having a full set of porcelain. Her statement now is that she very much prefers porcelain, even to platina, and thinks it is strong and very durable, and she thinks there cannot possibly be anything better then porcelain.

Now I have felt called upon to make this comparison between porcelain and gum work.

Dr. J. A. McClellan, of Louisville, Ky., said he would state a few facts only:

I want to correct the impression that is in the minds of some of the dentists in regard to this new material that is known as "Consolidated Collodion," or "Rose-Pearl Base," and gum for artificial teeth:

It is nothing new; but until I rendered it in a solid form it never was done. I have produced, and can show, solid blocks of collodion, without any pores, and containing no interglobular spaces, and guarantee it to be a unit throughout. So much for that. I mention this from the fact that two or three patents have been issued upon combinations of collodion for other things and other purposes, but no man can produce a solid substance of collodion alone, to my knowledge, except by my process. I have patents for that in this country and in Europe.

The question is universally asked, "Will it not contract?" It does; and that is the property that renders it so valuable. Any thing that is used in the moist state must contract, or when that moisture left it it would leave it in a porous condition. As I said before, we depend upon that for its strength. You all know that collodion has been used for a long time in surgery, for dressing wounds. I exhibited some specimens in Cincinnati last year, and you will see here in these specimens that the improvement has advanced. It is equally practicable for partial as for full sets, and in many cases far more so, but we find it very practicable for full plates. Parties having worn every other base in use, are now wearing this, and I have testimony from some of the best citizens, mayors, bankers, &c., in favor of this base.

This base is not affected in the least by the action of the saliva of the mouth, or anything that is taken into the mouth; neither

is it affected by the strongest acids. It has lain in nitric acid for two months, and has not been injured in the least. Boiling water will soften it sufficiently to allow you to mould it into shape, but it does not change the property it possesses. That contractile property gives great strength. It embraces the teeth. In the front teeth I would not like to say so much about it.

It is very practicable for alterations and repairs, more so than any base we have ever had or been acquainted with. In the thinness and lightness of the material, it is superior to anything I know of.

The time required to put up this substance is greater than almost any other base that has ever been used, that is, I do not mean the working time is longer, but from the time the impression is taken till you can send a piece from the laboratory is about four days. I have sent them, however, in three days. The working time, in my hands, is three hours on a nice particular piece. I can produce from four to six of them a day until we arrive at the waiting process, then we can go on to something else. I do not mention this so as to recommend it as being very easily produced, for it certainly requires more skill than vulcanite work. There is room to display your work and skill. You have the advantage of arranging your teeth just as you can in a continuous gum. It is very practicable in filling up. I can take a piece that has been made, and make it a little fuller in any part I choose. Another advantage; should a duplicate be required, it can be put up with the same moulds that made the original piece. It is only necessary to have the same kind of teeth, and you can duplicate it very nicely, just the same, and on the principle required by Dr. Kingsley.

Dr. Atkinson said he was wearing a partial plate of this material in his own mouth, and did not think it was possible to get so perfect an adaptation with other material.

Dr. Taft, Chairman of Publishing Committee for 1867, reported:—

Your committee would report that they have had printed three hundred copies of the transactions of the sessions of this Associa-

tion of 1867 at a cost of $350. To those entitled to the transactions copies have been sent. There are about 150 copies still on hand, which are at the disposal of the Association.

J. TAFT.

On motion of Dr. John Allen,

Resolved: That the remaining copies of the proceedings for 1867, now in the hands of the Publishing Committee, be put into the market for sale, as the committee in charge of the same may deem proper.

The President, Dr. Taft, announced that the time had arrived for closing the labors of this Association, and said:

I think the position we occupy is a matter of gratification to us all, as we certainly are on a better platform now than we have been for years. I trust that we will all go home with a renewed determination to make this Association more useful, and able to accomplish better results for the progress and inprovement of our profession, than it has ever done. I feel greatly encouraged by the work of yesterday and to-day. I feel joyful and happy in that which has been accomplished to-day and yesterday.

I now declare this Association adjourned till the first Tuesday in August, 1869.

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